European Aviation Safety Agency

Notice of Proposed Amendment (NPA) 2015-19

Executive interior accommodation

RMT.0264 (MDM.066) — 17.12.2015

EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) addresses an economic and regulatory coordination issue related to the certification of executive cabin interiors in large aeroplanes.

CS-25 (certification specifications for large aeroplanes) is applicable to all turbine-powered large aeroplanes. As most of those aeroplanes are used by airlines, the requirements of CS-25, inherited from the Joint Aviation Authorities (JAR 25), have been drafted taking into account large transport aeroplanes, featuring cabin interiors equipped for the commercial carriage of relatively high numbers of passengers. CS-25 is, therefore, not fully adapted to cabin interiors of so-called business aeroplanes, i.e. those that are arranged with lower-density interiors, offer a greater level of comfort and amenities, and are often non-commercially operated. This results in various interpretations of the CS-25 requirements for the above-mentioned category of aeroplanes, which, therefore, intensifies the risk of an uneven safety level, excessive and undue certification costs (due to the systematic issuance of certification review items (CRIs) at certification projects' level), and a lack of standardisation with other airworthiness authorities.

This NPA proposes to add to CS-25 a new Appendix for 'Low-occupancy aeroplanes' (new term introduced by this NPA in order to provide greater clarity compared to undefined terms such as 'very important person (VIP)', 'executive', 'business jets', etc.) and non-commercially operated aeroplanes (commonly called 'private-use aeroplanes'). The proposed changes are mainly based on existing CRIs and, hence, expected to decrease the costs of certification projects for both industry and EASA, while maintaining an acceptable level of safety. An enhancement of regulations harmonisation is also expected, taking into account FAA Special Federal Aviation Regulation (SFAR) No. 109.

In addition, new and amended CS-25 requirements are proposed, which were found to be fully applicable to any kind of transport category aeroplanes certified under CS-25 regardless of the type of interior arrangement or operation.

The proposed amendments have been prepared by a stakeholder-led rulemaking group (SLRG) composed of European Union (EU), United States (US), Brazilian and Canadian large aeroplane manufacturers and modifiers, with the continuous involvement of European Aviation Safety Agency (EASA), Federal Aviation Administration (FAA) and Transport Canada Civil Aviation (TCCA) expert panels.

Applicability	
Affected regulations and decisions:	ED Decision 2003/2/RM (CS-25)
Affected stakeholders:	Large aeroplane manufacturers; modifiers; cabin equipment suppliers; operators
Driver/origin:	Cost-effectiveness
Reference:	AMC to CS-25; FAR Part 25/related ACs; SFAR No. 109; various EASA CRIs & FAA IPs

Process map	
Concept Paper:	No
Terms of Reference (Issue 1):	29.2.2012
Rulemaking group:	Yes (SLRG)
RIA type:	Light
Technical consultation during NPA drafting:	No
Duration of NPA consultation:	2 months
Review group:	Yes
Focused consultation:	No
Publication date of the Opinion:	N/A
Publication date of the Decision:	Q3/2016

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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed this notice of proposed amendment (NPA) in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the Agency's 4-year Rulemaking Programme under RMT.0264 (MDM.066).

The text of this NPA has been developed by the Agency, based on a draft prepared by a stakeholder-led rulemaking group (SLRG). It is hereby submitted for consultation of all interested parties[3].

The process map on the title page contains the major milestones of this regulatory activity to date and provides an outlook of the timescale of the next steps.

1.2. The structure of this NPA and related documents

Chapter 1 of this NPA contains the procedural information related to this task. Chapter 2 (Explanatory Note) explains the core technical content. Chapter 3 contains the proposed text for the new requirements. Chapter 4 contains the regulatory impact assessment (RIA) showing which options were considered and what impacts were identified, thereby providing the detailed justification for this NPA.

1.3. How to comment on this NPA

Please submit your comments using the automated **comment-response tool (CRT)** available at http://hub.easa.europa.eu/crt/[4].

The deadline for submission of comments is **17 February 2016**.

1.4. The next steps in the procedure

Following the closing of the NPA public consultation period, the Agency will review the comments received.

The outcome of the NPA public consultation will be reflected in the respective comment-response document (CRD), which the Agency will publish together with the Decision amending CS-25.

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1 Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1).

2 The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of Regulation (EC) No 216/2008. Such a process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board (MB) Decision No 01-2012 of 13 March 2012 concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material (Rulemaking Procedure).

3 In accordance with Article 52 of Regulation (EC) No 216/2008 and Articles 5(3) and 6 of the Rulemaking Procedure.

4 In case of technical problems, please contact the CRT webmaster (crt@easa.europa.eu).

2. Explanatory Note

2.1. Overview of the issues to be addressed

Certification specifications for large aeroplanes (CS-25), is applicable to all turbine-powered large aeroplanes. As most of those aeroplanes are used by airlines, the requirements of CS-25, that were inherited from the Joint Aviation Authorities (JAR 25), have been drafted taking into account large transport aeroplanes, featuring cabin interiors equipped for the commercial carriage of relatively high numbers of passengers; it is therefore not fully adapted to cabin interiors installed in so-called business aeroplanes, i.e. those having lower-density interiors that offer a greater level of comfort and amenities (installation of showers, convertible sofas, cooktops, large entertainment displays, etc.) and sometimes being non-commercially operated.

Even though the current regulatory framework in some cases distinguishes between the aforementioned business aeroplanes and the others, this distinction is made using as a criterion the maximum seating capacity (less than 20), which is very limitative and no longer appropriate when considering the emergence of VIP interiors on larger aeroplanes.

NOTE: Terms such as 'business aeroplane', 'executive interior', 'VIP aircraft' etc. are commonly used during discussions/consultations on this NPA (e.g. in the context of the stakeholder-led rulemaking group (SLRG)), but formal definitions do not exist. This can often lead to confusion and lack of clarity when it comes to the cabin interiors that are associated with higher comfort/amenity aeroplanes. The proposals made in this NPA solve this issue by creating a new term and definition thereof ('Low-occupancy aeroplane', see Chapter 2.4.1 below). However, the NPA introducing this inevitably continues at times to use the older undefined terms. When such terms are used, the reader is requested to consider the general concept of aeroplanes with passenger accommodation that offers a high level of comfort, space and amenities.

Numerous CRIs are issued for each certification project involving these aeroplanes. They address repetitive issues like access to emergency exits, width of aisles, heat release and smoke density properties of materials, interior doors, etc. This often serves only the administrative purpose of documenting mature and non-controversial recurrent subjects, or covering the different interpretations of the requirements, at times to the detriment of a level playing field amongst industry stakeholders.

This NPA proposes to introduce a set of common requirements and intended interpretations (in the form of AMCs) that will establish a level playing field for all applicants with regard to the specificities of business aeroplanes, while continuing to provide an acceptable level of safety.

Said requirements are in most cases only applicable to either 'low-occupancy aeroplanes' (newly introduced definition) or non-commercially operated aeroplanes, however, a few of those requirements were finally found to be fully applicable to any type of transport category aeroplane certified under CS-25.

Although a broad consensus was reached within the SLRG for most of the proposed amendments, some discussions on a limited number of issues to be addressed were not conclusive. The SLRG

delivered to the Agency a draft NPA which included four dissenting views to be arbitrated. These different opinions are presented in Chapter 6 below, together with the final decision of the Agency.

2.2. Objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2 of this NPA.

The specific objectives of this proposal are:

— to clarify CS-25 requirements and interpretations thereof, based on experience feedback from certification projects, whilst reducing costs and administrative burden on applicants and the Agency when certifying executive interiors (avoid repetitive issuance of CRIs); and

— to provide alternative criteria to the ones included in the current CS-25 for certifying executive interiors in large aeroplanes, which will take into account the specificities of low-occupancy aeroplanes' interiors and the intended type of operations of such aeroplanes; the ultimate goal is to maintain a high and uniform level of safety, while facilitating the development and certification of executive interiors.

In addition, both objectives are intended to ensure a level playing field among type certificate (TC) and supplemental type certificate (STC) holders, by harmonising the rules (between the FAA and EASA) and the interpretations thereof.

2.3. Summary of the regulatory impact assessment (RIA)

For the RIA, considering the issues and objectives defined in Chapters 2.1 and 2.2 above (further detailed in Chapter 4), the following five options have been identified and compared:

— Option 0 ('do nothing') does not address the issue identified;

— Option 1 (adopt SFAR No. 109 as it is) does not fit into the EASA regulatory system and is limited to non-commercially operated aeroplanes;

— Option 2 (amend Book 2 of CS-25 only) was found inappropriate to fully meet the objectives, in spite of lightening the rulemaking task; and

— Option 3 (amend both Book 1 and 2 of CS-25) would ensure full coverage of the identified issues and entirely meet the objectives, while maintaining the common core basis of the airworthiness requirements for large aeroplanes in a single CS.

— Option 4 (create a specific new CS for executive interiors) would also ensure full coverage of the identified issues and entirely meet the objectives; a new CS, however, would create more workload in terms of drafting and maintaining in the long run. It was, therefore, discarded because it would entail more costs and burden than benefits.

Hence, the option of proposing a set of additional and amended requirements of CS-25 (Option 3) has been considered as the most appropriate because said new requirements are fully consistent with the safety objectives of CS-25 and this option would adequately meet the objectives defined.

Further details on options and their impacts can be found in Chapter 4.

2.4. Overview of the proposed amendments

2.4.1. Proposed new definition of 'low-occupancy aeroplane'

A definition of the term 'low-occupancy aeroplane' is proposed:

A low-occupancy aeroplane is defined as an aeroplane which has a maximum operational passenger seating configuration of:

— up to and including 19; or

— up to and including one third of the maximum passenger seating capacity of the type-certified aeroplane as indicated in the aeroplane type certificate data sheet (TCDS), provided:

- the total number of passenger seats approved for occupancy during taxiing, take-off or landing does not exceed 100 per deck; and
- the maximum operational passenger seating configuration 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.

This new definition of type of aeroplanes aims at distinguishing the business aeroplanes from the other large aeroplanes, and has been developed in order to limit the applicability of several of the new proposed requirements, based on the following rationale:

A 19-passenger limit currently exists in CS-25 and FAR Part 25: some requirements are not applicable to large aeroplanes that have a maximum operational passenger seating configuration of 19 or less; these alleviations have been introduced taking into account the relatively small size of these aeroplanes and the favorable evacuation characteristics in case of emergency.

In the last 10–15 years, the high demand for comfortable (luxurious) and flexible means of aerial transportation has led to the introduction of an increasing number of large aeroplanes configured with 'VIP' or 'executive' interiors (such as the Airbus corporate jets (ACJs), the Boeing business jets (BBJs), and the Embraer Lineage business jet models) to complement the offer by traditional business aviation aeroplane manufacturers (limited to 19 seats). With interiors designed for a significantly lower number of passengers than the approved maximum seating capacity of the aeroplane, the cabin safety issues raised are often the same as the ones of the more traditional business aviation aeroplanes (less than 19 seats).

A survey on large aeroplanes certified over the last 10–15 years that have a maximum operational passenger seating configuration of 20 or more and are configured with executive interiors has been conducted (more than 60 cabin floor plans, provided by the large aeroplanes manufacturers and modifiers represented within the SLRG, have been analysed). This survey showed that these aeroplanes have mostly a passenger seating capacity that does not exceed one third of the maximum passenger seating capacity allowed by the TCDS.

After reviewing numerous examples of such aeroplanes, it was considered that their evacuation and aisle characteristics were in general very favourable compared to arrangements composed of conventional seat rows in a higher-density cabin floor layout, and that a much lower evacuation time than with the current requirement (90 sec as per CS 25.803(d)) could be expected (see Figure 1).

The new definition of 'low-occupancy aeroplane' encompasses those aeroplanes that have a passenger seating capacity limited to 19 (as per the relevant TCDS), as well as larger aeroplanes configured for operating with no more than one-third of the approved passenger seating capacity of the relevant type/model (both in total capacity and per zone, i.e. between the original emergency exits pairs).

However, it was found appropriate to keep an upper passenger capacity limit and, based on the above-mentioned survey, this limit was set to 100 passengers per deck.

This definition better demarcates the market segment of Business Aeroplanes from a pure design perspective, regardless of the type of operations (commercial or non-commercial).

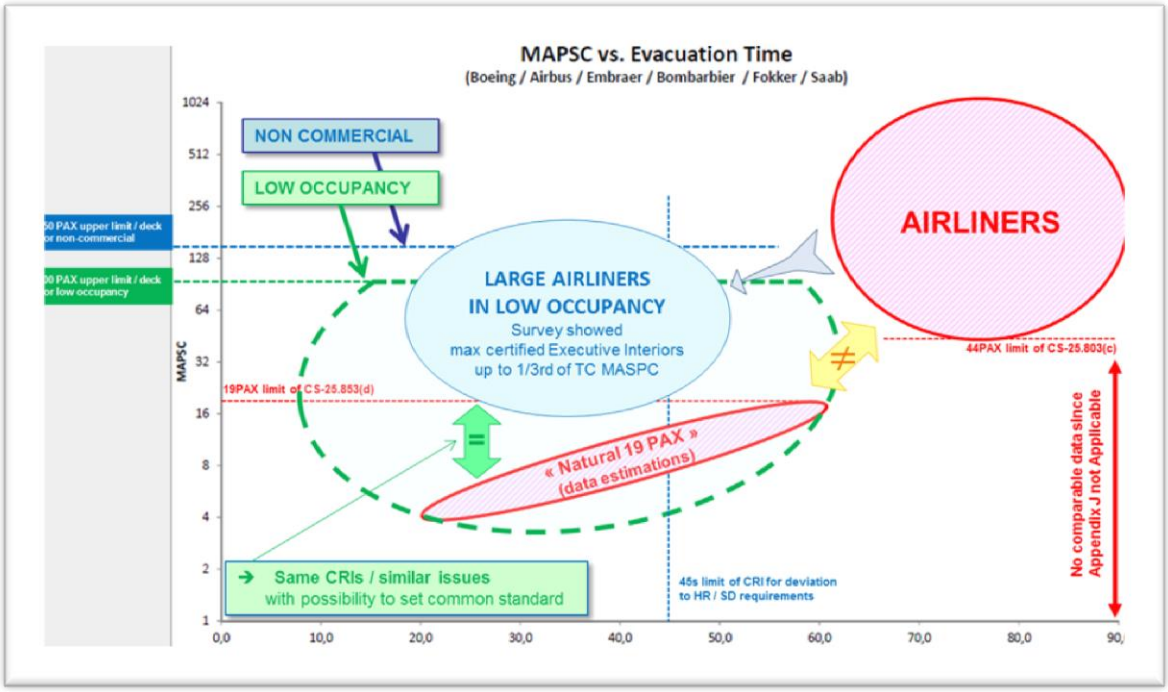


Figure 1: Evacuation characteristics of large airliners configured for low occupancy

2.4.2. Proposed amendments to CS-25

A new CS-25 Appendix (Appendix S) is proposed, which consists of a set of requirements specific to the non-commercially operated and low-occupancy aeroplanes, as well as the associated AMCs. Where necessary, the applicability of each requirement is further restricted to the relevant category of aeroplanes (commercially operated or low-occupancy aeroplanes, or with a maximum passenger seating capacity of 19 or less).

The table below provides an overview of the newly introduced requirements of Appendix S to CS-25, as well as of both the new and amended requirements of CS-25 that were found to be fully applicable

to any kind of transport category aeroplanes certified under CS-25, regardless of the type of interior arrangement or operation.

Point	Type of change	Change description	Rationale
CS 25.603(a)	Amended	Reference to the relevant AMC	This is a **new AMC** only. This proposal has been developed based on existing CRIs means of compliance (MoC)/interpretative material (IM) and on existing approved designs; it is intended to address installations which are mostly found on executive interior aeroplanes, but could possibly be installed in any kind of large aeroplane. In addition, large glass items are not satisfactorily addressed in the current CS-25.
CS 25.785	Amended	Reference to the relevant AMC	This is a **new AMC** only. This proposal has been developed based on existing CRIs MoC/IM and on existing approved designs; it is intended to address possible seat installations on any kind of large aeroplanes which are not satisfactorily addressed in the current CS-25 (beds, berths, divans convertible into a bed), such as possible seats available for in-flight use only, as well as seats in excess of the maximum certified passenger capacity.
CS 25.788	New	Requirements for miscellaneous passenger amenities in the cabin.	This paragraph of the CS is created to gather all proposed and future new requirements addressing passenger amenities, such as showers, installations related to in-flight entertainment etc.
CS 25.788(a)	New	Requirements for shower installations	This new paragraph formalises into CS-25 the principles of the **'Proposed Special Condition on Shower installation Applicable to Large Aeroplane category'** already published on the EASA website for public consultation (expiration date: 2 October 2009). An AMC to this new requirement is also introduced.

CS 25.788(b)	New	Qualification of large display panels to be installed in the cabin.	It was found necessary to introduce a new requirement addressing specifically large display panels because those are not satisfactorily addressed in the current CS-25. The requirement is complemented by a new AMC which has been developed based on existing MoC/IM CRIs and existing approved designs; it is intended to address a technology that could be installed on any kind of large aeroplane.
CS 25.807(e)(2)	New	Maximum seat-to-exit distance; related AMC 25.807 is accordingly amended.	**Additional requirement introduced to deal with a previously unregulated case.** The current rule was found to be insufficient to address aeroplanes with a single exit pair and significant cabin length. This new requirement has a similar safety intent to the 60 ft rule (CS 25.807(f)(4)) which applies to aeroplanes having more than one pair of passenger emergency exits.
CS 25.811(d)	Amended	Reference to the relevant AMC.	This is a **new AMC** only. This proposal has been developed based on existing CRIs MoC/IM and existing approved designs; it addresses the possibility to merge the emergency exit signs required by CS 25.811(d)(1), (d)(2) and (d)(3), in consistency with the relevant part of FAA AC 25.17A, 'Transport Airplane Cabin Interiors Crashworthiness Handbook', dated 18.5.2009.
CS 25.811(e)(4)	Amended	Removal of the requirement of having the emergency exit handle motion markings in red colour. The relevant AMC is as well amended in order to ensure harmonisation of the signs' colours in the cabin.	This new paragraph formalises into CS-25 the principles of the **'Proposed Equivalent Safety Finding to CS 25.811(e)(4): "Emergency Exit Marking". Applicable to Boeing 787'** already published on the EASA website for public consultation (expiration date: 27 December 2010). The aim of this change is to have a less prescriptive rule, keeping the goal (safety) of consistency in the colour used for emergency exit signs and emergency exit handle motion markings.

CS 25.812(b)	Amended	Revision to remove ambiguity regarding the 'background' on a symbolic emergency exit sign: unlike a text-based sign, the symbols are illuminated, not the background.	The new wording is less prescriptive and lowers the risk of confusion. The amended AMC has been developed based on existing CRIs MoC/IM and existing approved designs.
CS 25.812(e)(3)	New	Revision to the floor proximity escape path marking requirement for a compartment that does not traverse the main cabin aisle.	**Harmonisation with Article 9(b) of SFAR No. 109**. Aim of the change is to have a less prescriptive rule (no requirement for a specific marking of a 'path'). This proposal should have no appreciable effect on safety since the intended safety objective is met (avoidance of incorrect identification of the direction to the nearest exit). The Agency considers that the applicability of this improved requirement does not need to be limited to non-commercially operated aeroplanes.
CS 25.812(l)(1)	Amended	Adaptation of the rule regarding remaining functional emergency lighting following fuselage transverse separation for small cabin aeroplanes. A new AMC is as well introduced.	**Harmonisation with Article 9(c) of SFAR No. 109**. The current rule was found too prescriptive and almost impractical for small cabin aeroplanes: for small cabins with low passenger capacities, the current 25 % limit on lights rendered inoperative by a transverse separation makes compliance difficult. It does not add appreciably to safety as the distance to any exit is shorter than the corresponding distance in a typical large aeroplane of transport category. For such aeroplanes that require fewer emergency lights to begin with, a higher percentage of inoperative lights does not reduce the level of safety.
CS 25.813	Amended	Reference to new AMC 25.813(e)	This is a **new AMC** only. This proposal has been developed based on existing CRIs MoC/IM and existing approved designs: it clarifies that an interior door(s) installation is always acceptable if the door(s) is/are secured open such that it/they may be restored to their functioning condition as (a)

			door(s) only through a maintenance action; this is a situation where the door(s) need no longer be considered as such, as it/they cannot close. This is intended to address certain aeroplanes designed to be used non-commercially for certain flights (internal doors allowed) and commercially for other flights (internal doors not allowed).
CS 25.813(c)(4)(i)	Amended	The length of the unobstructed area in front of the emergency exit is set at 40 cm instead of the width of the narrowest passenger seat installed.	Revision considered to provide an **equivalent safety level**. There is no reason to require a greater distance on aeroplanes fitted only with large business, first-class or executive seats as this does not provide a higher level of safety whereas being an excessive requirement. In order to restore a justified level of safety, it is proposed that the width of the seat is a criterion only when the minimum distance of 40 cm is not ensured.
CS 25.813(c)(4)(ii)	No change	Amended AMC 25.813(c)	This is a new paragraph added to the existing AMC. This proposal has been developed based on existing CRIs MoC/IM and existing approved designs; it provides further clarification on features that would be considered as a minor obstruction when using compensating factors.
CS 25.854	Amended	Extension of the applicability of the lavatory fire protection requirements to any aeroplanes featuring a cabin length of 60 ft or more. A new AMC is as well introduced.	**Additional requirement introduced to deal with a previously unregulated case.** A cabin length limit is added to the existing passenger capacity limit in order to address cases of larger cabins configured for passenger capacity of 19 seats or less. The proposed cabin size limit is based on a survey of already certified aeroplanes with 19 seats or less, and will ensure that only such aeroplanes with limited cabin length are exempted from the lavatory fire protection requirement, as per the initial intent of the rule.
CS 25.1365(b)	Amended	Prevention of other risks than overheat and fire associated with galleys and cooking appliances, namely smoke, burns and spilled	This new paragraph formalises into CS-25 the principles of the **'Proposed Special Condition on Cooktop installation Applicable to A318-112'** already published on the EASA website for public consultation (expiration date: 20 April 2009). It is intended to better address risks associated with galleys

		liquids. A new AMC is as well introduced.	and cooking appliances. **The proposal is based on Article 14 of SFAR No. 109**. The current regulations did not envision cooktops when they were written; they do not adequately address the various safety concerns associated with the installation and operation of these devices and do not address at all their installation and use.
CS 25.1447(c)(1)	No change	Amended AMC 25.1447(c)(1)	**New paragraphs** are added **in the AMC** only. This proposal has been developed based on existing CRIs MoC/IM and existing approved designs; it is intended to address the provision of supplemental oxygen for seat installations that might be found on any kind of large aeroplanes, which are not satisfactorily addressed in the current CS-25.
CS 25.1447(c)(3)	Amended	Wording improvement for the CS to be less prescriptive. The relevant AMC has been amended as well.	Simplification of the rule with the sole objective of having sufficient oxygen supply were needed (**less prescriptive**). The new rule is considered to be **equivalently safe**. The more prescriptive aspects are now in the relevant AMC.
CS 25.1541	No change	Amended AMC 25.1541	A **new paragraph** is added **in the AMC** only. This proposal has been developed based on existing CRIs MoC/IM and existing approved designs; it is intended to provide acceptable examples of symbolic (or pictogram) placards.
Appendix S	New	New set of requirements applicable to executive interiors	See Chapter 2.3 — Summary of the regulatory impact assessment (RIA) above.
S25.1(a)	New	Applicability of new Appendix S.	See Chapter 2.4.1 — Proposed new definition of 'low-occupancy aeroplane' above. See also Table 2 below.
S25.1(b)	New	Aeroplane flight manual (AFM) limitation introduced in order to	This requirement is intended to clarify the expected operating limitation required in the AFM when some of the provisions of Appendix S are used,

		mention non-commercial operations, if appropriate.	being in **full consistency with the existing requirements of CS 25.1501 and CS 25.1525.**
S25.10(a)	New	Alleviation regarding the installation of interior doors on non-commercially operated aeroplanes	This new paragraph formalises into CS-25 the principles of the **'Proposed Deviation to JAR 25.813(e)'** already published on the EASA website for public consultation (expiration date: 1 August 2014). **The proposal is based on Article 10 of SFAR No. 109**.
S25.10(b)	New	Alleviation regarding the installation of interior doors on commercially operated aeroplanes	This is a new proposed requirement to allow a single internal door on commercially operated aeroplanes with 19 or fewer passenger seats. It is elsewhere proposed that in lieu of complying with CS 25.813(c), a Type III or IV emergency exit on a commercially operated aeroplane with 19 or fewer passenger seats, if meeting several compensating provisions, may have an adjacent moveable item that could completely obstruct the exit (see S25.20(b)) in Table 1 below, and the associated proposed provision in this NPA). With this in mind, it was agreed that maintaining the prohibition of internal doors in accordance with CS 25.813(e) would be an inconsistency. This was because the prohibition of an internal door is primarily based on the risk that it may close in a crash and adversely affect access to an emergency exit. This is the same safety issue as for moveable items adjacent to a Type III or IV emergency exit. After due consideration, it was concluded that the safety rationale developed for the Type III/IV emergency exit case could also be used for the internal door case. Namely, high-integrity position monitoring/indication systems, and furthermore, in the case of the door, automated-opening and hold-open systems and frangibility can be required. This was concluded to negate all but a small portion of the safety concerns and provide an acceptable level of safety for aeroplanes with a maximum passenger seating configuration of 19. On this basis, it is proposed that in lieu of complying with CS 25.813(e), for a commercially operated aeroplane

			with 19 or fewer passenger seats, one internal door may be installed, provided that its location and design meet a set of compensating provisions (see proposed S25.10(b) in this NPA) and that the same aeroplane does also not have an emergency exit with an adjacent moveable item that relies on S25.20(b) for acceptability. This latter provision limits any non-compliance with the normal regulatory standards of CS-25 affecting access to emergency exits at one location per aeroplane.
S25.10(c)	New	Introduction of a minimum standard for isolated compartments.	This new paragraph formalises into CS-25 the principles of the **'Proposed Special Condition on Isolated Compartments. Applicable to A318-112 VIP'**, already published on the EASA website for public consultation (expiration date: 27 March 2009). Isolated compartments have been accepted for many years via special conditions (SCs). This new rule and its associated AMC not only align broadly with what has been accepted in the past, but also with the proposed change to CS 25.854, regarding smoke detection provision for aeroplanes with less than 20 passengers capacity.
S25.10(d)	New	Introduction of conditions under which exits may be deactivated.	Limits are set when deactivating exits, such that a **similar safety level** regarding the ability to access an exit as provided by the basic CS (CS 25.807(e)) is maintained.
S25.10(e)	New	Introduction of conditions under which the '60 ft' requirement of CS 25.807(f)(4) may be not complied with.	**Harmonisation with Article 7 of SFAR No. 109**. This is only acceptable for non-commercially operated aeroplanes. An application to commercially operated aeroplanes was seen as an excessive lowering of safety. Notice of proposed rulemaking (NPRM) No FAA-07-13 (which led to SFAR No. 109) provides further justification.

S25.20(a)	New	— (a)(1) allows certain bed mattresses to not comply with the oil burner test requirement. — (a)(2) is an alleviation for non-commercially operated aeroplanes only to not comply with heat release/smoke density requirements provided a 45 sec evacuation capability is substantiated.	— (a)(1) It is considered that mattresses in permanent (not convertible) seats/beds in an isolated compartment, not traversed by any escape route, do not constitute a post-crash hazard. Therefore, the **level of safety is not adversely affected**. — (a)(2) **Harmonisation with Article 12 of SFAR No. 109**: long-standing deviation issued by the Agency for non-commercially operated aeroplanes only.
S25.20(b)	New	Alleviation in order to allow deployable items in front of Type III and IV exits provided certain conditions are met or design precautions are taken.	This new paragraph formalises into CS-25 the principles of the **'Proposed Equivalent Safety Finding on JAR 25.813 (c)(2) - Applicable to Dassault Aviation Falcon 7X'** already published on the EASA website for public consultation (expiration date: 28 May 2012) and **'Proposed Equivalent Safety Finding to JAR 25.813(c)(2)'** already published on EASA website for public consultation already published on the EASA website for public consultation (expiration date: 7 September 2015). This new paragraph and the associated AMC provide alleviations for CS 25.813(c)(4)(ii), which defines an area where obstructions in front of Type III or IV emergency exits should be avoided. The purpose of this amendment is to provide guidance for the case of protruding items that due to compensating factors, may be considered acceptable.
S25.30(a)	New	It allows non-commercially operated aeroplanes and	This new paragraph formalises into CS-25 the principles of the **'Proposed Deviation on JAR/CS 25.815'** already published on the EASA website for

		aeroplanes with less than 19 passengers seating capacity (irrespective of the type of operations) to use aisle space in flight for deployable items provided the ability to easily access all areas is substantiated.	public consultation (expiration date: 13 April 2014). **The proposal is based on Article 11 of SFAR No. 109**. It is accepted that the limited cabin space justifies that 19-seat aeroplanes should be allowed reduced aisle width in flight; larger aeroplanes are also accepted on the basis that the overall safety level is not worse.
S25.30(b)	New	It provides a more relaxed position regarding firm handholds for VIP type cabins, where fewer features for handholds are typically available (e.g. seats are fewer and further apart).	**Harmonisation with Article 4(a) of SFAR No. 109**: CS 25.785 is intended to enable passengers and crew to steady themselves in the aisles as they move about the cabin in moderate turbulence. It prescribes how an applicant for a type certificate complies with it, and narrowly defines where firm handholds are required. The level of safety is marginally reduced by this less prescriptive proposal to an acceptable extent for the aeroplanes considered. Further guidance is now part of a related AMC.
S25.40(a)	New	It allows to have a single 'No smoking' placard visible to passengers when entering the aeroplane instead of a sign visible to each seated passenger.	This new paragraph formalises into CS-25 the principles of the **'Proposed Deviation on JAR/CS 25.815'** already published on the EASA website for public consultation (expiration date: 12 August 2014). **The proposed text is harmonised with Article 6 of SFAR No. 109**.
S25.40(b)	New	Introduction of the possibility for non-commercially operated aeroplanes only to reduce the number of placards related to configuring the cabin for taxiing, take-off and landing.	This proposed alternative CS is considered to **improve safety** in the private environment, taking full credit for the passenger familiarity argument: as regards non-commercially operated aeroplanes, many passengers will likely use the same aeroplane frequently and, thus, be more familiar with its interior features than the general public would be with the various commercial aeroplane interiors. Therefore, those passengers' ability to use equipment, and their knowledge of exit operation of a specific aeroplane, is

			generally presumed to be more sophisticated than the general public's. Due to the small number of passengers, the operators can provide a more detailed safety briefing than the typical one on commercial flights.
S25.40(c)	New	— Recognition of what is a rather common case in VIP aeroplanes, i.e. that there are seats in excess; and — Provision of the associated requirements for placards and markings.	**Harmonisation with Article 2 of SFAR No. 109**. This proposal is based on already issued CRIs with interpretative material. When there are more seats suitable for occupation during taxiing, take-off and landing than the requested maximum occupancy, there is a need for clarification to achieve the intent of the CS.
S25.50(a)	New	Alleviation of the direct-view requirement (CS 25-785(h)(2)).	The proposed alleviation in Paragraph (1) is for non-commercially operated aeroplanes and **aligns with** Article 5 **of SFAR No. 109**. The proposed alleviation in Paragraph (2) has been developed for low-occupancy aeroplanes in a commensurate manner.
S25.50(b)	New	Clarity provided on acceptable stowage compartment latching mechanisms other than the normally accepted 'double latching' ones.	Solutions other than double latching are always acceptable, but in the case of VIP aeroplanes, such solutions are more sought after. The intent of this new requirement, as an alternative to CS 25.787(b), is only to introduce a specific alternative AMC to cover the specificities of VIP aeroplanes, while providing an acceptable level of safety.

Table 1: Overview of the proposed changes

The following table provides an overview of the applicability of new Appendix S:

Paragraph	Applicability	
	Non-commercially operated aeroplanes[5]	Low-occupancy aeroplanes[6]
S25.1(b)	X	
S25.10(a)	X	
S25.10(b)	X	PAX ≤ 19
S25.10(c)	PAX > 19	PAX > 19
S25.10(d)	X	X
S25.10(e)	X	
S25.20(a)	X	X
S25.20(b)	X	PAX ≤ 19
S25.30(a)	X	PAX ≤ 19
S25.30(b)	X	X
S25.40(a)	X	X
S25.40(b)	X	
S25.40(c)	X	X
S25.50(a)	X	X
S25.50(b)	X	X

Table 2: Applicability of new Appendix S to CS-25

[5] Non-commercially operated aeroplanes as defined in S25.1 of new Appendix S. Note: some paragraphs have an applicability limited to aeroplanes with a passenger seating capacity of more than 19 (PAX > 19).

[6] Low-occupancy aeroplanes as defined in S25.1 of new Appendix S. Note: some paragraphs have an applicability limited to aeroplanes with a passenger seating capacity of 19 or less (PAX ≤ 19), or more than 19 (PAX > 19).

The first type of aeroplanes eligible to be considered as 'VIP/executive' are those used for non-commercial operations. The level of safety established by the proposals on such aeroplanes has been found adequate based on the familiarity passengers of such aeroplanes develop with their cabin environment. This was considered valid for cabin configurations up to 150 passengers per deck, based on a review of existing approved executive cabin configurations, and is consistent with a number of CRIs issued by the Agency over the last 10–15 years for non-commercially operated aeroplanes.

The other category of eligible aeroplanes are the low-occupancy aeroplanes as newly defined in S25.1 of Appendix S (see Chapter 2.4.1 — Proposed new definition of 'low-occupancy aeroplane' above). It is implicit that those aeroplanes are potentially commercially operated. A subset of this category are the 19-seaters.

A maximum passenger seating capacity of 19 is a differentiator that exists in the current CS-25, and the majority of 'VIP/executive' interiors are designed for 19 passengers or fewer. It is recognised that there are smaller aeroplanes for which a 19-passenger seats configuration would in fact represent a high-density interior. However, it has been considered, for all paragraphs applicable to this category of aeroplanes, that either the density of occupants is not relevant to the level of safety or there are additional mitigating factors, such as the reduced size of the cabin (reduced distance for the crew to reach any part of the cabin).

2.4.3. Proposed amendments to other regulations and decisions

The SLRG also discussed a possible **amendment to CS-26** ('Executive Director Decision 2015/013/R of 8 May 2015 adopting Certification Specifications for additional airworthiness specifications for operations CS-26 — Issue 1'). The proposed amendment to CS-26 was intended to exempt newly defined low-occupancy aeroplanes from the proposed CS 26.60 'Emergency landing — dynamic conditions' (see NPA 2013-20). This discussion has been finally transferred to the relevant rulemaking task RMT.0069, whose purpose is to introduce this new requirement into CS-26.

The SLRG also considered introducing the new definition of 'low occupancy aeroplane' in an **amended CS-Definitions on Definitions and Abbreviations**, in order to ensure the consistency of the definition used in several CSs (CS-25, CS-26). However, in the frame of the aforementioned rulemaking task RMT.0069, it was found necessary to introduce this definition in Annex I (Part-26) to Commission Regulation (EU) 2015/640, which is an implementing rule (IR) to the Basic Regulation, and therefore, a definition only introduced in CS-Definitions cannot be directly used. Hence, it was finally decided to repeat this definition in CS-25, and not in CS-Definitions, since it is not anticipated that any other CS would need to use this definition.

The SLRG also discussed an **amendment to GM 21.101** (Guidance Material (GM) to Annex I (Part-21) to Regulation (EC) No 748/2012 (Decision No. 2003/1/RM of the Executive Director of the Agency of 17 October 2003 on acceptable means of compliance and guidance material for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations ('AMC and GM to Part 21')). The proposed amendment would affect the table of Appendix A to AMC and GM to Part-21, and was intended to avoid classification of a change in the number of exits (as it is the case when deactivating exits) as a significant one. This proposed amendment has been finally forwarded to the EASA/FAA/TCCA Continuous Improvement Team (CIT) on implementing and standardising the changed product rule (CPR).

3. Proposed amendments

The text of the amendment is arranged to show deleted text, new text or new paragraph as shown below:

(a) deleted or amended text is with marked with a strikethrough: ~~deleted~~;

(b) changed or new text is marked with grey shading;

(c) an ellipsis (…) indicates that the remaining text is unchanged in front of or following the reflected amendment.

3.1. Draft regulation (Draft EASA Opinion)

N/A.

3.2. Draft Certification Specifications (Draft EASA Decision)

3.2.1. Draft amendment to CS-25 — Book 1

BOOK 1

SUBPART D — DESIGN AND CONSTRUCTION

Amend CS 25.603 as follows:

CS 25.603 Materials

(~~F~~for Composite Materials, see AMC 20-29, for use of glass in passenger cabins, see AMC 25.603(a))

(…)

Amend CS 25.785 as follows:

CS 25.785 Seats, berths, safety belts and harnesses

(…)

(h) Each seat located in the passenger compartment and designated for use during take-off and landing by a cabin crew member required by the Operating Rules must be~~.~~:

(…)

(2) To the extent possible, without compromising proximity to a required floor level emergency exit, located to provide a direct view of the cabin area for which the cabin crewmember is responsible. (See AMC 25.785(h)(2))

(…)

Create a new CS 25.788 as follows:

CS 25.788 Passenger amenities

(See AMC 25.788)

(a) *Showers*: If a shower cubicle is installed (See AMC 25.788(a) and AMC 25.1447(c)(3)):

(1) audio and visual 'Return to seat' indications, readily audible and visible to a shower cubicle occupant, and activated at the same time as the signs required by CS 25.791(b), must be provided;

(2) audio and visual indications of the need for oxygen use, readily audible and visible to a shower cubicle occupant, and activated in the case of cabin depressurisation or deployment of the oxygen-dispensing units in the cabin, must be provided;

(3) placards must be installed to indicate that the shower cubicle must not be used for the stowage of cargo or passenger baggage;

(4) firm handhold features must be provided inside the shower cubicle; and

(5) the shower cubicle must be designed in a way to preclude anyone from being trapped inside. If a locking mechanism is installed, it must be capable of being unlocked from the inside and the outside without the aid of any tool.

(b) *Large display panels*: Any large display panel installed in the passenger compartment must not be a source of danger to occupants when submitted to any flight/ground load condition (including emergency landing conditions prescribed in CS 25.561), any load to be expected in service, and a possible cabin depressurisation. (See AMC 25.788(b))

Amend CS 25.807 as follows:

CS 25.807 Emergency exits

(…)

(e) *Uniformity.*

(1) Exits must be distributed as uniformly as practical, taking into account passenger seat distribution.

(2) Each passenger seat approved for use during taxiing, take-off or landing must be located in a way that:

(i) it is within 9.14 m (30 ft) from the nearest emergency exit on one side of the fuselage on the same deck, and within 13.72 m (45 ft) from the nearest emergency exit on the other side of the fuselage on the same deck; and

(ii) the occupant of that seat would not have to traverse any point in the cabin that is more than 9.14 m (30 ft) from the nearest emergency exit on one side of the fuselage on the same deck and more than 13.72 m (45 ft) from the nearest emergency exit on the other side of the fuselage on the same deck to reach any emergency exit.

(…)

Amend CS 25.811 as follows:

CS 25.811 Emergency exit marking

(…)

(d) The location of each passenger emergency exit must be indicated by a sign visible to occupants approaching along the main passenger aisle (or aisles). There must be (See AMC 25.811(d)) ~~—~~:

(…)

(e) The location of the operating handle and instructions for opening exits from the inside of the aeroplane must be shown in the following manner: (…)

(4) All Type II and larger passenger emergency exits with a locking mechanism released by motion of a handle, must be marked so as to its operation by an ~~red~~ arrow with a shaft at least 19 mm (0.75 inches) wide, adjacent to the handle, that indicates the full extent and direction of the unlocking motion required. The word OPEN must be horizontally situated adjacent to the arrowhead and must be in ~~red~~ capital letters at least 25 mm (1 inch) high. The arrow and word OPEN must be located on a background, which provides adequate contrast. (See AMC 25.811 (e)(4))

(…)

Amend CS 25.812 as follows:

CS 25.812 Emergency lighting

(…)

(b) Emergency exit signs~~—~~

(1) For aeroplanes that have a passenger-seating configuration, excluding pilot seats, of 10 seats or more must meet the following requirements:

(i) Each passenger emergency exit locator sign required by CS 25.811 (d)(1) and each passenger emergency exit marking sign required by CS 25.811(d)(2) must have red letters on an illuminated white background or a universal symbol, of adequate size (See AMC 25.812(b)(1)). These signs must be internally electrically illuminated with ~~a background~~ the brighter area having a brightness of at least 86 candela/m2 (25 foot lamberts) and a high-to-low contrast no greater than 3:1.

(…)

(e) Floor proximity emergency escape path marking must provide emergency evacuation guidance for passengers when all sources of illumination more than 1.2m (4ft) above the cabin aisle floor are totally obscured. In the dark of the night, the floor proximity emergency escape path marking must enable each passenger to –

(1) (…); ~~and~~

(2) (…) (See AMC 25.812(e)(2)) ~~.~~; and

(3) in the case of passengers seated in seats authorised for occupancy during taxiing, take-off and landing in a compartment that does not incorporate any part of the main cabin aisle, in lieu of CS 25.812(e)(1), exit this compartment and enter the main cabin aisle using only markings and visual features not more than 1.2 m (4 ft) above the cabin floor, and proceed to the exits using the marking system necessary to complete the actions as described in CS 25.812(e)(1) and (e)(2) above.

(…)

(l)(1) ~~Not more than 25% of all~~ The percentage of electrically illuminated emergency lights required by this paragraph which are rendered inoperative, in addition to the lights that are directly damaged by the separation~~;~~, does not exceed the values set in the following table (See AMC 25.812(l)(1)):

Maximum approved seating capacity of the type-certified aeroplane as indicated in the aeroplane's type certificate data sheet (TCDS)	Percentage
More than 19	25 %
10 to 19	33.33 % (i.e. one third)
Less than 10	50 %

(…)

Amend CS 25.813 as follows:

CS 25.813 Emergency exit access and ease of operation

(…)

(c)(4)(i) For aeroplanes that have a passenger seating configuration of 20 or more, the projected opening of the exit provided may not be obstructed and there must be no interference in opening the exit by seats, berths, or other protrusions (including adjacent seats adjusted to their most adverse positions) for a distance from that exit not less than the width of the narrowest passenger seat installed on the aeroplane or 40 cm, whichever is the least.

(…)

(e) No door may be installed between any passenger seat that is occupiable for take-off nd landing and any passenger emergency exit, such that the door crosses any egress path (including aisles, cross-aisles and passageways). (See AMC 813(e))

(…)

Amend CS 25.854 as follows:

CS 25.854 Lavatory fire protection

(See AMC 25.854)

For aeroplanes with a passenger capacity of 20 or more, or with a cabin length of 18.29 m (60 ft) or more ~~–~~ :

(…)

SUBPART F — EQUIPMENT

Amend CS 25.1365 as follows:

CS 25.1365 Electrical appliances, motors and transformers

(…)

(b) The installation of galleys and cooking appliances must be such ~~as to~~ that it minimises the risk of overheat, ~~or~~ fire, smoke, burns or spilled liquids to the aeroplane, passengers and crew (See AMC 25.1365(b)).

(…)

Amend CS 25.1447 as follows:

CS 25.1447 Equipment standards for oxygen ~~–~~ dispensing units

(…)

(c)(3) There must be ~~at least two~~ sufficient outlets and units of dispensing equipment of a type similar to that required by sub-paragraph (c)(1) of this paragraph in all other ~~compartments or work~~ areas that may be occupied by passengers or crew members during flight~~, i.e. toilets, washrooms, galley work areas, etc~~. (~~S~~See AMC 25.1447 (c)(3))

(…)

APPENDICES

Create a new Appendix S as follows:

Appendix S

Airworthiness requirements for non-commercially operated aeroplanes and low-occupancy aeroplanes

(See AMC to Appendix S)

S25.1 General

(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 an approved maximum passenger capacity of:

(i) up to and including 19 passengers; or

(ii) up to and including one half of the approved maximum passenger seating capacity of the type-certified aeroplane as indicated in the aeroplane type certificate data sheet (TCDS), provided that the total number of passengers does not exceed 150 per deck; or

(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 maximum operational passenger seating configuration of:

(i) up to and including 19; or

(ii) up to and including one third of the approved 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 maximum operational passenger seating configuration 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.

S25.10 General Cabin Arrangement

(a) *Interior Doors on Non-Commercially Operated Aeroplanes* (See AMC to Appendix S, S25.10(a)): a door may be installed in the passenger cabin of a non-commercially operated aeroplane, such that it crosses a possible passenger egress path (including aisles, cross aisles and passageways) between one or more passenger seats that can be occupied during taxiing, take-off and landing and one or more passenger emergency exits, provided that in lieu of the requirements of CS 25.813(e), the following requirements are met:

(1) the door must be placarded on either side to be in the open position during taxiing, take-off and landing;

(2) the door must be frangible (or equivalent, e.g. it has a removable panel) in either direction;

(3) in the open position, dual means are provided to secure the door in the open position for taxiing, take-off and landing; each of those dual means must be capable of reacting to the inertia loads specified in CS 25.561;

(4) the door must be operable from either side and if a latch is installed to restrain the door in the closed position, it must be capable of being unlatched from either side without the aid of any tool;

(5) there is a means to signal the flight crew in a timely manner if the door is not open and secured in the safe taxiing, take-off or landing configuration; and

(6) the AFM must include a limitation requiring a pre-flight passenger briefing containing instructions on the operation of the door, including frangibility features.

(b) *Interior Doors on Commercially Operated Aeroplanes* (See AMC to Appendix S, S25.10(b)): A total of one door may be installed in the passenger cabin of a low-occupancy aeroplane having a maximum operational passenger seating configuration of 19 or less, such that it crosses a possible passenger egress path (including aisles, cross aisles and passageways) between one or more passenger seats that can be occupied during taxiing, take-off and landing and one or more passenger emergency exits, provided that in lieu of the requirements of CS 25.813(e), the following requirements are met:

(1) the provisions of S25.20(b) are not used;

(2) the door is at a location such that for each passenger and crew member, at least one evacuation path to an emergency exit that does not involve movement through the door remains;

(3) the door is clearly placarded on either side to be in the safe (i.e. open and secured) position during taxiing, take-off and landing;

(4) the door opening/closing geometry is such that forward emergency landing inertia forces will not tend to force it closed, and loose items in the cabin are not likely to hinder its opening;

(5) the door is frangible (or equivalent, e.g. it has a removable panel) in either direction and is clearly placarded on both sides to indicate this feature;

(6) the door and its operating system is designed such that:

(i) the door is easily operable from either side;

(ii) it opens automatically, or stays open, and remains secured in the open position when the aeroplane enters any of the following flight phases: taxiing, take-off, approach and landing; the automatic opening, and retention in the open and secured position, must function following complete loss of normal electrical power;

(iii) in the open position, dual means are provided to secure the door in the open position for taxiing, take-off and landing; each of those dual means must be capable of reacting to the inertia loads specified in CS 25.561;

(iv) closing of the door is only possible in flight, when the aeroplane is outside of the taxiing, take-off, approach and landing flight phases, or on ground for maintenance purposes;

(v) following any single failure of the closing/latching mechanism, the door will default to the fully open and secured position; and

(vi) following any single failure, the remaining functional elements will provide an opening from floor to ceiling at least 15 inches wide;

(7) the unavailability of any possible egress path for any crew member or passenger involving movement through the door, i.e. the combined failure of the internal door and the emergency exit for said egress path, must not be more probable than remote;

(8) there is a means to signal the flight crew in a timely manner if the door is not open and secured in the safe taxiing, take-off or landing configuration; and

(9) the AFM must include a limitation requiring a pre-flight passenger briefing containing instructions on the operation of the door, including frangibility features.

(c) *Isolated Compartments*: each cabin compartment isolated from the rest of the cabin in a way 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 maximum operational 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 of more emergency exits, that results in non-compliance with CS 25.807(e)(1), is acceptable provided 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 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 requirements of CS 25.807(e)(2) are still complied with, considering only the remaining non-deactivated emergency exits.

(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 exits is created only once per side of the fuselage on each deck (See AMC to Appendix S, S25.10(d) and (e)).

S25.20 Emergency Evacuation

(a) *Flammability Requirements*

(1) Mattresses of permanent bed installations that are located in compartments isolated from the main passenger cabin by doors or equivalent means that would normally be closed

during taxiing, take-off and landing need not meet the 'Oil Burner Test' requirement of Appendix F, Part II as required by CS 25.853(c) (See AMC to Appendix S, S25.20(a)(1)).

(2) On non-commercially operated aeroplanes only, compliance with CS 25.853(d) need not be demonstrated if it can be shown by test or a combination of test and analysis under the conditions specified in Appendix J that the maximum time for evacuation of all occupants does not exceed 45 sec.

(b) *Access to Type III and IV Emergency Exits*: low-occupancy aeroplanes that have a maximum operational passenger seating configuration of 19 or less and non-commercially operated aeroplanes may have a deployable item in the region defined by CS 25.813 (c)(4)(i) or CS 25.813 (c)(1), (2) or (3) which creates an obstruction and, therefore, leads to non-compliance with one or more of the aforementioned requirements, provided that the provisions of S25.10(b) are not used, and that:

(1) per design and procedure, it is ensured that the obstruction will be entirely removed before entering any of the taxiing, take-off, approach and landing phases, by means of a position monitoring and alerting system that in a timely manner, notifies the flight crew and compels the passengers to stow the item if it is in a position that creates an obstruction (See AMC to Appendix S, S25.20(b)); it must be demonstrated that with the obstruction in its most adverse position(s), the remaining exit is at least as effective as a Type IV exit, unless it can be shown that following any single failure, an exit at least as effective as a Type IV exit can be obtained by simple and obvious means; or

(2) the passenger capacity of the aeroplane is reduced below that allowed by CS 25.807(g) and it is demonstrated that the reduced number of passengers can be evacuated, with the obstruction in its most adverse position and under the conditions of Appendix J, at least as quickly as the maximum number of passengers allowed by CS 25.807(g) could without the obstruction; it must be demonstrated that with the obstruction in place, the remaining exit is at least as effective as a Type IV exit; or

(3) for aeroplanes required to have at least one cabin crew member on board, the item is intended for use by a cabin crew member that has direct view to the deployable item and can confirm that it is correctly stowed and secured while they are seated during taxiing, take-off and landing.

S25.30 Circulation Inside Cabin During Flight

(a) *Width of Aisle*: for low-occupancy aeroplanes that have a maximum operational passenger seating configuration of 19 or less, and non-commercially operated aeroplanes, the design must be such that the dimensional requirements of CS 25.815 can be achieved during all flight phases, except that the width of aisle may be reduced to 0 m during in-flight operations provided compliance with the following additional requirements is shown (See AMC to Appendix S, S25.30(a)):

(1) all areas of the cabin must be easily accessible by passengers or crew in the event of an emergency situation (e.g., in-flight fire, depressurisation);

(2) placard instructions for restoring the aisle to the taxiing, take-off and landing configuration must be provided at the locations where the width of the cabin aisle is reduced; and

(3) procedures must be established and documented in the AFM for restoring the aisle width for taxiing, take-off and landing.

(b) *Firm Handholds*: in lieu of the requirements of CS 25.785(j), if the seat backs do not provide a firm handhold, there must be an acceptable means to enable persons to steady themselves while using the aisles in moderately rough air (See AMC to Appendix S, S25.30(b)).

S25.40 Markings and Placards

(a) '*No Smoking' Placards and Lavatory Ashtrays*: if smoking is to be prohibited:

(1) in lieu of the requirements of CS 25.791(a) and CS 25.791(d), a single 'No smoking' placard must be provided, conspicuously located inside the passenger compartment, and installed in the immediate vicinity of each door that can be used as a passenger boarding door; the placard must be clearly legible for passengers entering the aeroplane — compliance with CS 25.853(g) is not required;

(2) The indication that smoking is prohibited must be the subject of a passenger briefing, and the requirement for this briefing must be part of the AFM.

(b) *Briefing Card Placard*: for non-commercially operated aeroplanes, the instructions required by CS 25.1541 for properly setting the cabin in its configuration approved for taxiing, take-off and landing may alternatively be provided by a reduced number of placards, each one referring to a briefing card. In that case (See AMC to Appendix S, S25.40(b)):

(1) the detailed minimum instructions to be included in the briefing card must be part of the type design and referred to in the 'Limitations' Section of the AFM; and

(2) the briefing card must be easily accessible from each passenger seat; a dedicated stowage must be provided to stow the briefing card within easy reach of each seated passenger with their seat belts fastened.

(c) *Seats in Excess* (See AMC to Appendix S, S25.40(c))

(1) If the total number of seats that are approved for occupancy during taxiing, take-off and landing is greater than the maximum certified passenger configuration, a placard indicating the maximum certified passenger configuration must be installed adjacent to each door that can be used as a passenger boarding door. This placard must be clearly legible for passengers entering the aeroplane. Additionally, a note must be included in the 'Limitations' Section of the AFM stating that there are excess seats installed and indicating the maximum number of passengers that may be transported.

(2) For each seating location available for in-flight use only (including in-flight-only seats, beds, berths and divans), it must be clearly marked that it is not to be occupied during taxiing, take-off and landing.

S25.50 Miscellaneous

(a) *Cabin Attendant Direct View*

(1) For non-commercially operated aeroplanes, in lieu of the requirements of CS 25.785(h)(2), at least half of the installed cabin crew member seats must face the passenger cabin.

(2) For low-occupancy aeroplanes, compliance with CS 25.785(h)(2) may be based on the standards of AMC to Appendix S, S25.50(a)(2).

(b) *Stowage Compartment Latching Mechanisms*: Latching mechanisms must be appropriate for the type of area in which they are installed (See AMC to Appendix S, S25.50(b)).

3.2.2. Draft amendment to CS-25 — Book 2

BOOK 2

AMC — SUBPART D

Create a new AMC 25.603(a) as follows:

AMC 25.603(a)

Large Glass Items

1. General

This AMC defines acceptable minimum performance standards for large glass items used as an interior material in passenger cabin installations whereby the glass items carry no other loads than those imposed by the mass of the glass itself, in case of rapid depressurisation or abuse loads.

Large glass items should be shown not to be a hazard during events such as an emergency landing and cabin depressurisation.

(1) A glass panel is considered to be a large glass item if:

(i) the maximum dimension exceeds 51 cm (20 in.);

(ii) the surface area of one side exceeds 0.12 m² (200 in.²); or

(iii) the glass mass exceeds 4 kg.

In case of multiple items in close proximity, the accumulated surface area of glass as well as the total mass should be considered (i.e. effects such as tiling should be considered).

(2) A large glass item should meet the following requirements whenever installed in compartments that may be occupied during taxiing, take-off and landing, or may be traversed during an emergency evacuation:

(i) The glass item should be subjected to, and pass, a ball impact testing (see Paragraph 2 below).

(ii) The glass item should be subjected to, and pass, an abuse load testing (see Paragraph 3 below).

(iii) The glass item should meet the requirements outlined in CS 25.561(b)(3), (c) and (d). A safety factor of 2.0 should be applied to glass items to account for variability in the production of the material and for long-term degradation.

(iv) Cracking of glass should not produce a condition where the material may become hazardous to the occupants (e.g. sharp edges, splinters or separated pieces). This requires destructive testing. If any of the test conditions defined below (see Paragraphs 2 and 3 below) do not result in a significant failure of the glass item, testing at a higher impact energy (ball impact test) or load (abuse load test) level

should be performed until destruction, or until an impact energy of 80 J or double of the specified abuse load is reached.

Tests should be performed for worst-case conditions (e.g. the largest glass item should be tested against the maximum engraving). Similarity demonstrations may then be used for other items to show compliance.

These tests need not be performed for glass items (e.g. standard lavatory mirrors, light bulbs, light tubes, galley equipment) that have traditionally been installed in large aeroplanes, provided that their installation method, location etc. are not unusual.

The instructions for continued airworthiness should reflect the fastening method used and should ensure the reliability of all methods used (e.g. life limit of adhesives, or clamp connection). For example, inspection methods and intervals for an adhesive-based design should be defined in accordance with adhesion data from the manufacturer of the adhesive, or actual adhesion test data, as necessary.

2. Ball Impact Tests

The test procedure(s) and pass/fail criteria of the Underwriters Laboratories standard UL 61965, *Mechanical safety for cathode ray tubes*, Edition 2, 27 July 2004, or former UL 1418, *Standard for safety cathode ray tubes*, Edition 5, 31 December 1992,or other equivalent approved method are the basis of the ball impact strength and no-hole tests described in this Paragraph, combined with the impact energy in Section 5.12.2 of ANSI/SAE Z26.1, *Safety glazing materials for glazing motor vehicles and motor vehicle equipment operating on land highways — safety standard*, 1 December 1997.

The glass samples should be installed in a test fixture representative of the actual installation in the cabin.

2.1. Strength Test

The large glass item should be subjected to a single impact applied in accordance with the test conditions of Paragraph 2.3 below. The impact energy should be 21 J, caused by a 51-mm diameter ball or, alternatively, by a 40-mm diameter ball, as specified in Paragraph 2.3.2 below.

The test is passed if the expulsion of glass within a 1-min period after the initial impact satisfies the following criteria:

(i) there is no glass particle (a single piece of glass having a mass greater than 0.025 g) between the 0.90 and 1.50-m barriers (see Paragraph 2.3.1) on either side (if appropriate);

(ii) the total mass of all pieces of glass between the 0.90 and 1.50-m barriers (see Paragraph 2.3.1) does not exceed 0.1 g on either side (if appropriate); and

(iii) there is no glass expelled beyond the 1.50-m barrier (see Paragraph 2.3.1) on either side (if appropriate).

2.2 No-Hole Test

The large glass item should be subjected to a single impact applied in accordance with the test conditions of Paragraph 2.3 below. The impact energy should be 3.5 J, caused by a 51-mm diameter ball as specified in Paragraph 2.3.2 below.

The test is passed if the large glass item does not develop any opening that may allow a 3-mm diameter rod to enter.

Note: If the large glass item does not develop any opening that would allow a 3mm rod to enter when subjected to the strength test defined in Paragraph 2.1 above, then the no-hole test defined in this Paragraph does not need to be performed.

2.3 Test Conditions

2.3.1 Test Apparatus and Setup

The large glass item should be mounted in a way representative of the aeroplane installation.

The centre of the large glass item should be 1.00 ± 0.05 m above the floor.

For the strength test (see Paragraph 2.1 above), two barriers, each one made of material 10–20 mm thick, 250 mm high and 2.00 m long, should be placed on the floor in front of the test item (or on both sides in case of a glass partition) at the specified location, measured horizontally from the front surface of the large glass item to the near surface of the barrier. The barriers may be less than 2.00 m long, provided that they extend to the walls of the test room. A non-skid surface such as a blanket or rug may be placed on the floor.

A solid, smooth, steel ball of the size specified in Paragraph 2.3.2 below should be suspended by suitable means such as a fine wire or chain and allowed to fall freely as a pendulum and strike the large glass item with the specified impact energy. The large glass item should be placed in a way that its surface is vertical and in the same vertical plane as the support point of the pendulum. A single impact should be applied to any point on the surface of the large glass item at a distance of at least 25 mm from the edge of the surface.

2.3.2 Impact Objects

The 51-mm diameter steel ball used as an impact object should have a mass of approximately 0.5 kg and a minimum Scale C Rockwell Hardness of 60.

The 40-mm diameter steel ball used as an impact object should have a mass of approximately 0.23 kg and a minimum Scale C Rockwell Hardness of 60.

3. Abuse Loads Tests

The large glass item should withstand the abuse loads defined in Paragraph 3.2 below when subjected to the test conditions defined in said Paragraph. The panel should remain attached to the fixture, and any failure should be shown to be non-hazardous (e.g. no sharp edges, no separation of pieces).

3.1 Test conditions

Abuse loads should be applied:

(i) at the points that would create the most critical loading conditions; and

(ii) at least at the geometrical centre, and at one point located along the perimeter.

For the above-mentioned load applications, it is acceptable to use any loading pad with a shape and dimensions that fit into a 15.24-cm (6-in.) diameter circle.

For all tests, the glass item should be mounted in a test fixture representative of the actual installation in the cabin.

3.2 Loads to be applied

Abuse loads should be considered as ultimate loads, therefore, no additional factors (e.g. fitting factors, casting factors, etc.) need to be applied for abuse load analysis/testing.

Abuse loads are defined as follows (see also Figure 1 below):

3.2.1 Pushing loads

Pushing loads are 133 daN (300 lbs) from 0–1.5 m (60 in.) above the floor, reducing linearly to 44 daN (100 lbs) at 2 m (80 in.) above the floor level (see (1) in Figure 1 below).

3.2.2 Pulling loads

One-hand pull loads (where it is not possible to grab with two hands) are 66 daN (150 lbs) from 0–1.5 m (60 in.) above the floor, reducing linearly to 22 daN (50 lbs) at 2 m (80 in.) above the floor level (see (3) in Figure 1 below).

Two-hands pull loads are 133 daN (300 lbs) from 0–1.5 m (60 in.) above the floor, reducing linearly to 44 daN (100 lbs) at 2 m (80 in.) above the floor level (see (1) in Figure 1 below).

3.2.3 Up loads

Up loads are 66 daN (150 lbs) from 0–1.5 m (60 in.) above the floor, reducing linearly to 22 daN (50 lbs) at 2 m (80 in.) above the floor level (see (2) in Figure 1 below).

3.2.4 Stepping, Seating loads

Only for large glass items which may be stepped or sat on, a load of 222 daN (500 lbs) should be used. This load is to be applied at the most critical point, and on any relevant surface up to 1 m (38 in.) above the floor level (see (4) in Figure 1 below).

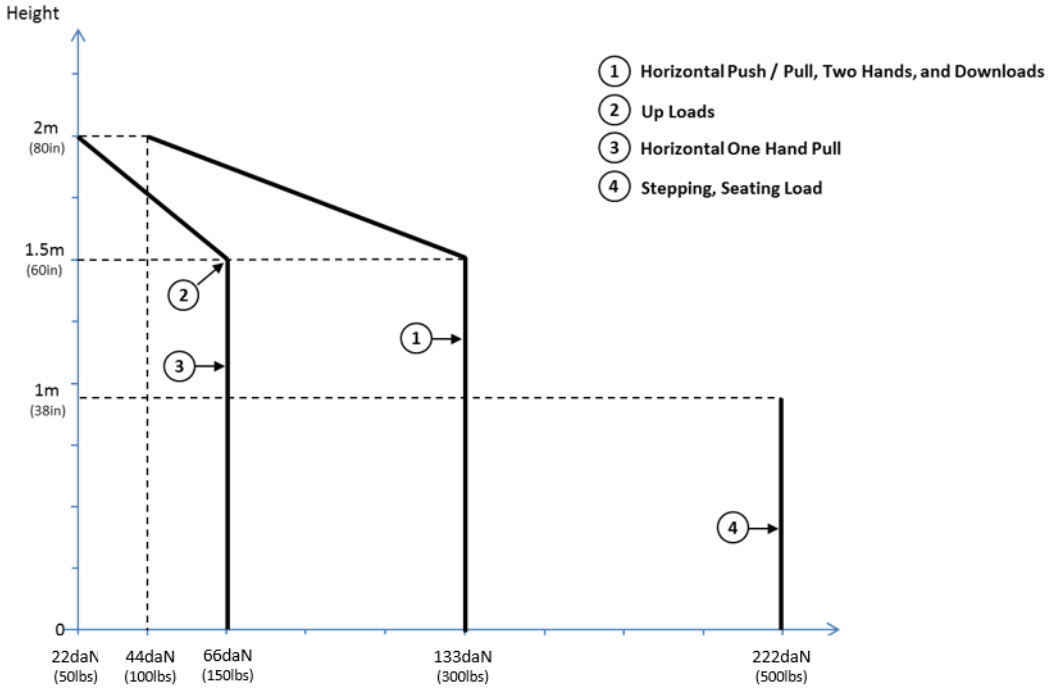


Figure 1

Amend AMC 25.785 as follows:

AMC 25.785

Seats, B~~b~~erths, S~~s~~afety B~~b~~elts and H~~h~~arnesses

(…)

Beds, berths or divans convertible into a bed should be equipped with a restraint device (e.g. a belt). Beds, berths etc. that may be occupied by more than one passenger may be equipped with a single belt.

Create a new AMC 25.785(h)(2) as follows:

AMC 25.785(h)(2)

Cabin Attendant Direct View

If the total number of passenger seats approved for occupancy during taxiing, take-off and landing is greater than the maximum operational passenger seating configuration, the demonstration of compliance with the direct-view requirements should consider the most adverse combination of occupied seats, assuming the full passenger load on board.

Create a new AMC 25.788(a) as follows:

AMC 25.788(a)

Installation of Showers

The following should be considered in the design of a shower installation:

(a) An analysis should be performed to identify possible water leakage failures, and to show that appropriate safety features have been included in the design.

(b) The shower cubicle should be considered as a passenger compartment in terms of the need for ventilation. The applicant should justify that adequate ventilation is provided within the shower. The cabin air itself can be considered as a 'fresh air' source for the air supply of the shower.

(c) The shower cubicle air outflow should be directed into aeroplane areas that may not be affected by the high water content of this air flow.

(d) If electrical power outlets are installed in the vicinity of the shower cubicle, all following requirements should be fulfilled:

(i) no electrical power outlet should be installed closer than 0.3 m from the shower cubicle;

(ii) each electrical power outlet installed between 0.3 and 0.6 m from a shower cubicle should be covered with a lid or be installed in a way that the opening points are pointing straight downwards; and

(iii) the shower cubicle should be enclosed up to the ceiling.

Create a new AMC 25.788(b) as follows:

AMC 25.788(b)

Large Display Panels

1. General

This AMC does not apply to flight deck display panels. A display panel should be considered a large one if its diagonal is greater than 51 cm (20 in.).

Any large display panel should be shown not to be a hazard during events such as emergency landing and cabin depressurization. It should meet the following requirements:

(i) the large display panel should withstand the differential pressures caused by a worst-case cabin depressurization event without having any adverse effect (for instance no substances should be released through cracks or openings, no sharp edges should be created);

(ii) the large display panel should be subjected to, and pass, an abuse load testing (see Paragraph 3 below);

(iii) the installation should withstand the inertia loads outlined in CS 25.561(b)(3) without any adverse effect;

(iv) if the large display panel incorporates glass, it should be subjected to, and pass, a ball impact testing (see Paragraph 2 below);and

(v) the type and amount of chemical substances released into the cabin in case of failure of the screen should not result in adverse health effects on cabin occupants.

With the exception of the ball impact testing, large display panels incorporating any glass element should withstand the above-defined loads with no more than minor cracks (i.e. no parts released

nor the surface becoming a hazard) and without becoming dislodged from their mounts. Alternatively, the installation may still be found acceptable if some means, such as a protective cover, are provided to shield the passenger cabin from the glass monitor. The installation including its protective cover should meet all the relevant criteria identified in this AMC. Furthermore, the cover should not introduce additional hazardous characteristics of its own and should comply with all pertinent aeroplane certification requirements, e.g. flammability.

Documentation should be provided from medical authorities which substantiates that the type and amount of chemical substances released into the cabin in case of failure of the screen would not result in adverse health effects on cabin occupants. The specific cabin volume may be considered. As an acceptable substantiation is considered if each installed glass screen has been shown to comply with A 4(1) of Directive 2002/95/EC 'on the restriction of the use of certain hazardous substances in electrical and electronic equipment' (RoHS).

2. Ball Impact Testing (only for display panels containing glass)

The test procedure and pass/fail criteria of the Underwriters Laboratories standard UL 61965, *Mechanical safety for cathode ray tubes*, Edition 2, 27 July 2004 or former UL 1418, *Standard for safety cathode ray tubes*, Edition 5, 31 December 1992 or other equivalent approved method are the basis of the ball impact strength and no-hole tests described in this Paragraph.

The large display panel should be installed in a test fixture representative of the actual installation in the cabin.

2.1. Strength Test

The large display panel should be subjected to a single impact applied in accordance with the test conditions of Paragraph 2.3 below. The impact energy should be 7 J, caused by a 51-mm diameter ball or, alternatively, 5.5 J, caused by a 40-mm diameter ball, as specified in Paragraph 2.3.2 below.

The test is passed if the expulsion of glass within a 1-min period after the initial impact satisfies the following criteria:

(i) there is no glass particle (a single piece of glass having a mass greater than 0.025 g) between the 0.90 and 1.50-m barriers (see Paragraph 2.3.1);

(ii) the total mass of all pieces of glass between the 0.90 and 1.50-m barriers (see Paragraph 2.3.1) does not exceed 0.1 g; and

(iii) there is no glass expelled beyond the 1.50-m barrier (see Paragraph 2.3.1).

2.2 No-Hole Test

The large display panel should be subjected to a single impact applied in accordance with the test conditions of Paragraph 2.3 below. The impact energy should be 3.5 J, caused by a 51-mm diameter ball as specified in P 2.3.2 below.

The test is passed if the large display panel does not develop any opening that may allow a 3-mm diameter rod to enter. Cracking of the panel is permitted though.

Note: If the large display panel does not develop any opening that would allow a 3-mm rod to enter when subjected to the strength test defined in Paragraph 2.1 above, then the no-hole test defined in this Paragraph does not need not to be performed.

2.3 Test Conditions

2.3.1 Test Apparatus and Setup

The large display panel should be mounted in a suitable fixture of rigid construction and appropriate dimensions. The fixture should be supported to prevent movement during the test.

The centre of the large glass item should be 1.00 ± 0.05 m above the floor.

For the strength test (see Paragraph 2.1 above), two barriers, each one made of material 10–20 mm thick, 250 mm high and 2.00 m long, should be placed on the floor in front of the test item (or on both sides in case of a glass partition) at the specified location, measured horizontally from the front surface of the large glass item to the near surface of the barrier. The barriers may be less than 2.00 m long, provided that they extend to the walls of the test room. A non-skid surface such as a blanket or rug may be placed on the floor.

A solid, smooth, steel ball of the size specified in Paragraph 2.3.2 below should be suspended by suitable means such as a fine wire or chain and allowed to fall freely as a pendulum and strike the large glass item with the specified impact energy. The large glass item should be placed in a way that its surface is vertical and in the same vertical plane as the support point of the pendulum. A single impact should be applied to any point on the surface of the large glass item at a distance of at least 25 mm from the edge of the surface.

2.3.2 Impact Objects

The 51-mm diameter steel ball used as an impact object should have a mass of approximately 0.5 kg and a minimum Scale C Rockwell Hardness of 60.

The 40-mm diameter steel ball used as an impact object should have a mass of approximately 0.23 kg and a minimum Scale C Rockwell Hardness of 60.

3. Abuse Load Tests (all large display panels)

Large display panels should withstand a 133 daN (300 lbs) static abuse load applied, in separate tests, in 5 different locations: in the centre, at the opposite corners (two separate tests), along the perimeter, at the midpoints of the short and long sides (two separate tests), or at an equivalent set of locations acceptable to the Agency (see Figure 2 below).

For all the tests to be performed, the display panels should be mounted in the test fixture representative of the actual installation in the cabin.

For the above-mentioned load applications, it is acceptable to use any loading pad with a shape and dimensions that fit into a 15.24-cm (6-in.) diameter circle.

The display panels should withstand the applied loads without any adverse effect (e.g. glass elements, if present, cracking or breaking, the unit becoming dislodged from its mounts, substances released through cracks or openings, or sharp edges created).

During the test, it is acceptable for the display to suffer minor failures, such as minor cracks, provided that no parts are detached or the surface does not become a hazard to occupants.

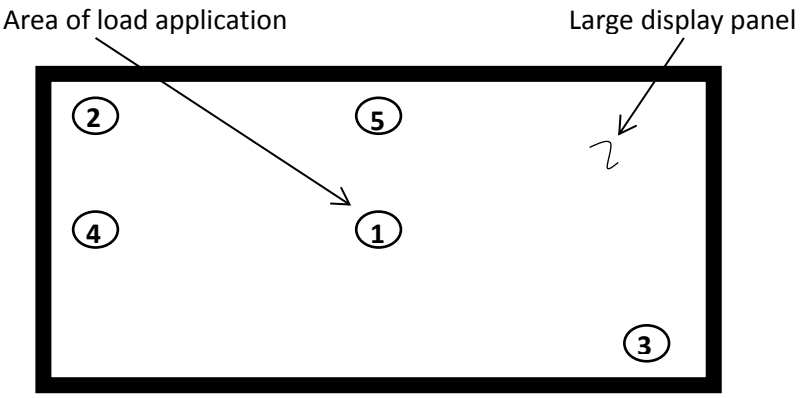


Figure 2 — Load Cases

1) Centre loading;

2) corner loading;

3) opposite-corner loading;

4) short-side-midpoint perimeter loading; and

5) long-side-midpoint perimeter loading.

Amend AMC 25.807 as follows:

AMC 25.807

Emergency Exits

(…)

FAA Advisory Circular 25.807-1 'Uniform Distribution of Exits', dated 08/13/90 is accepted by the Agency as providing acceptable means of compliance with CS 25.807(e).

When calculating the distance from a passenger seat to an exit, as required by CS 25.807(e)(2), this distance should be taken as the total longitudinal distance (i.e. as measured parallel to the aeroplane's longitudinal axis) that the escapee should cover in order to get to the exit in question (i.e. the distance calculated should take into account all required changes in direction of movement but measured only longitudinally). As starting point, the front edge of the seat bottom cushion is to be taken (for forward or aft-facing seats), and as end point, the nearest exit edge. For seats set at an angle of more than 18 degrees with respect to the aeroplane's longitudinal axis, the front edge of the seat bottom cushion at the seat centre line is to be taken as starting point.

For aeroplanes with an approved passenger seating configuration of 19 or less, only one pair of emergency exits is required. However, such aeroplanes may have additional exits installed, which must then comply with CS 25.807(h).

Such aeroplanes would not, however, be required to meet the 18.3-m (60-feet) rule of CS 25.807(f)(4). The distance between each passenger seat and the nearest available exit may be determined considering all available exits, including the ones addressed by CS 25.807(h).

Create a new AMC 25.811(d) as follows:

AMC 25.811(d)

Sign Combination

The signs required by CS 25.811(d)(1), (d)(2) and (d)(3) may be combined according to the applicable parts of FAA AC 25.17A, *Transport Airplane Cabin Interiors Crashworthiness Handbook*, 18 May 2009.

Amend AMC 25.811(e)(4) as follows:

AMC 25.811(e)(4)

Emergency Exit Marking

The indicating markings for all Type II and larger passenger emergency exit unlocking handle motions should conform to the general shapes and dimensions indicated by Figures 1 and 2.

The indicating markings should be consistent with the emergency exit signs chosen, i.e. red if letter exit signs are installed, and green if symbolic exit signs are installed.

(…)

Amend AMC 25.812(b)(1) as follows:

AMC 25.812(b)(1)

Emergency Lighting

~~Two~~ The acceptable methods of demonstrating compliance with the requirement of CS 25.812(b)(1) are as follows:

~~A locator sign, marking sign and bulkhead or divider sign should either:~~

(1) ~~— have red letters at least 38 mm (1.5 inches) high on an illuminated white background, and should have an area of at least 135 cm2 (21 square inches) excluding the letters. For locator and marking~~ all emergency exit signs ~~required by CS 25.811(d)(1) and (d)(2), the~~ should have a contrast between the brightest and darkest elements of at least 10:1;

~~—~~ emergency exit signs using letters should have letters that are at least 50 % as high as the overall height of the sign (but see Note 2 below) and have a ~~The~~ height to stroke width ratio ~~should not be~~ of not more than 7:1 nor less than 6:1; and

~~or;~~

(2) ~~—be a~~ symbolic emergency exit signs should be white and green in compliance with the ~~as derived from ISO/WD 3864-3 and ISO/CD 16069 "Safety Way Guidance System" and Draft BS 5499: Part 4 "Code of Practice for Escape Route Signing".~~ European Standard (EN) ISO 7010:2011, *Graphical symbols, safety colours and safety signs, registered safety signs*, and the white part of the symbolic element incorporating the 'running man' should be at least 80 % as high as the overall height of the sign.

~~The symbols should be white on a green background according to ISO 3864. The sign should have an area of at least 148 cm2 (23 square inches) including white symbols. The lighted background-to-symbol contrast should be at least 1:10.~~

~~For the symbolic sign required by CS 25.811(d)(2) (See Figure 2), the height of the symbols should be at least 38mm (1.5 inches).~~

For ~~the symbolic~~ an emergency exit sign required by CS 25.811(d)(1) ~~(See Figure 1)~~ and for ~~the symbolic~~ an emergency exit sign required on each bulkhead or divider by CS 25.811(d)(3) ~~(See Figure 3)~~, the ~~formula given in draft British Specification 5499 Part 4: "Code of practice for escape route signing", applies~~ following two formulas apply for calculating a maximum viewing distance. ~~The formula is as follows:~~ The maximum allowable viewing distance for a sign is the lower of the two values D_1 and D_2:

$$D_1 = Z \cdot a_s$$ ~~(where as and D have the same units)~~

$$D_2 = Z \cdot \sqrt{(x_s/2.5)}$$

where:

(1) Z is the distance factor obtained from Table 1 below;

(2) a_s is the overall height of the sign;

(3) x_s is the overall area of the sign; and

(4) $D1$, D_2, and a_s have the same units, and x_s is in the same squared units as D_1, D_2, and a_s.

~~The maximum allowable viewing distance "D" can be calculated from the overall height of the symbolic sign (as) by using the appropriate distance factor Z obtained from Table 1 below.~~

Table 1

Mean luminance of white contrast colour candela/m² (ft-L)	***Distance factor Z***
≥ 10 candela/m² (2.91 ft-L)	150
≥ 30 candela/m² (8.75 ft-L)	175
≥ 80 candela/m² (23.35 ft-L)	200
≥ 200 candela/m² (53.37 ft-L)	215
≥ 500 candela/m² (145.9 ft-L)	230

~~***Note 1:*** *The table given for reference is deduced from Table 2 in BS 5499.*~~

~~The maximum viewing distance "D" to be considered should be the maximum distance found between two adjacent exits on one side. If the minimum overall height calculated for the symbolic sign is less than 38mm (1.5 inches), 38 mm (1.5 inches) should be taken.~~

Note 1: Notwithstanding the above formulas, no emergency exit sign may:

(1) have an overall height (a_s) of less than 51 mm (2 in.);

(2) have the green areas constituting less than half of the total area of the sign (symbolic sign); and

(3) use English letters of less than 25-mm (1-in.) height.

Note 2: In the case of dual-language emergency exit signs, only the English text is to be considered in determining the effective overall height of the sign, i.e. the overall height of the sign (a_s) assumed in the above formula cannot be greater than twice the height of the English letters. However, in determining the area of the sign (x_s) for use in the above formula, the actual area may be used.

For each emergency exit sign required by CS 25.811(d)(1), and for each emergency exit sign required on each bulkhead or divider by CS 25.811(d)(3), at each point along any possible aeroplane egress path, the next closest required emergency exit sign visible at each point along the egress path should be placed in a way that it is no farther away from the escapee than the maximum allowable viewing distance calculated for that sign.

Egress paths to be assessed should be:

(1) any possible path from a seat that can be occupied during taxiing, take-off and landing to any emergency exit; and

(2) any possible path from a point adjacent to any emergency exit to any other emergency exit.

For an emergency exit sign required by CS 25.811(d)(2), the maximum allowable viewing distance of the sign (i.e. the lower of D_1 and D_2, as calculated above) should be at least twice the width of the cabin.

In determining both the overall height and overall width of a sign, no part of the sign outside of the white background (text signs) or green element (symbolic signs), for instance a surrounding contrasting border, should be included.

The inclusion of an arrow or arrows in any of the signs discussed above, in order to increase the understandability of the sign, is encouraged. The possibility to improve understandability, and the appropriate orientation of the arrows will depend on the particular installation. If arrows indicate movement other than straight ahead, the depicted movement direction of the 'running man' (to the right/to the left) should be chosen to be compatible with the orientation of the arrow(s).

There may be other reasons to choose a particular movement direction of the 'running man', for instance where a sign required by CS 25.811(d)(2) is placed to the left or right of the exit. In this case, the 'running man' should not suggest movement away from the exit.

Examples of acceptable designs of symbolic exit signs

CS 25.811(d)(1) (exit locator sign)	

CS 25.811(d)(2) (exit locator sign)	

CS 25.811(d)(3) (exit sign on bulkhead or divider)	

The design of ~~symbolic~~ emergency exit signs should be chosen to provide a consistent set throughout the cabin.

Amend AMC 25.812(b)(2) as follows:

AMC 25.812(b)(2)

Emergency Lighting

~~Two~~ The acceptable methods of demonstrating compliance with the requirement of CS 25.812(b)(2) are as follows:

~~A locator sign, marking sign and bulkhead or divider sign should either:~~ An emergency exit sign required by CS 25.811 (d)(1), (2), or (3) should have an overall height of at least 51 mm (2 in.) and its area should be no less than 65 cm^2 (10 in^2.).

In calculating both the overall height and area of a sign, no part of the sign outside of the white background (text signs) or green element (symbolic signs), for instance a surrounding contrasting border, should be included. Note 2 of AMC 25.812(b)(1) also applies to these signs.

It should either:

(1) have red letters ~~at least 25 mm (1 inch) high~~ on ~~an illuminated~~ a white background; ~~at least 51 mm (2 inches) high~~. the letters should be at least 50 % as high as the overall height of the sign, and have a letter height to stroke-width ratio of not more than 7:1 nor less than 6:1;

or~~,~~

(2) be a white and green symbolic exit sign in compliance with European Standard (EN) ISO 7010:2011, *Graphical symbols, safety colours and safety signs, registered safety signs*; the white part of the symbolic element incorporating the 'running man' should be at least 80 % as high as the overall height of the sign. ~~as derived from ISO/WD 3864-3 and ISO/CD 16069 "Safety Way Guidance System" and Draft BS 5499: Part 4 "Code of Practice for Escape Route Signing".~~

~~The symbols should be white on a green background according to ISO 3864. The lighted background-to-symbol contrast must be at least 1:10. The height of the symbols should be at least 38mm (1.5 inch).~~

The emergency exit sign should have a contrast between the brightest and darkest elements of at least 10:1.

The inclusion of an arrow or arrows in any of the signs discussed above, in order to increase the understandability of the sign, is encouraged. The possibility to improve understandability, and the appropriate orientation of the arrows will depend on the particular installation. If arrows indicate

movement other than straight ahead, the depicted movement direction of the 'running man' (to the right/to the left) should be chosen to be compatible with the orientation of the arrow(s).

There may be other reasons to choose a particular movement direction of the 'running man', for instance where a sign required by CS 25.811(d)(2) is placed to the left or right of the exit. In this case, the 'running man' should not suggest movement away from the exit.

The design of emergency exit signs should be chosen to provide a consistent set throughout the cabin.

Amend AMC 25.812(e)(2) as follows:

AMC 25.812(e)(2)

Emergency Lighting

~~An acceptable method of demonstrating compliance with the requirement of CS 25.812(e)(2) regarding identifiers of floor level exits is to have a symbolic sign showing a white arrow on a green background as identified in the figure.~~

~~NOTE: Mixing language signs with symbolic signs is not an acceptable method of demonstrating compliance with CS 25.812(b)(1), (b)(2), and (e)(2).~~

If it is desired to identify each exit by means of a symbolic sign, this sign should be white and green in compliance with European Standard (EN) ISO 7010:2011, *Graphical symbols, safety colours and safety signs, registered safety signs*.

Example of an acceptable design of symbolic sign to identify an exit

CS 25.812(e) (exit identifier)	

The direction of the 'running man' (to the left/to the right) should not suggest movement away from the exit.

The design of signs used to identify an exit should be chosen to be consistent with the emergency exit signs throughout the cabin.

Create a new AMC 25.812(l)(1) as follows:

AMC 25.812(l)(1)

Transverse Separation of the Fuselage

Within CS 25.812(l)(1), the phrase 'in addition to the lights that are directly damaged by the separation' means that when calculating the percentage of electrically illuminated emergency lights rendered inoperative by the fuselage separation, the number of lights whose function is lost due to loss of power or loss of control input to the lights should be divided by the total number of electrically illuminated emergency lights installed. The lights that are directly damaged by the fuselage separation should not be included in total in the numerator of the calculation, but only those whose function is lost due to loss of

power and/or control. The denominator should be the total of all electrically illuminated emergency lights installed.

Applicable parts of FAA AC 25.812-1A, *Floor proximity emergency escape path marking*, 22 May 1989 may be used.

Amend AMC 25.813(c) as follows:

AMC 25.813(c)

Emergency Exit Access and Ease of Operation

(…)

9 Minor obstructions

An item may be acceptable as meeting the intent of a minor obstruction in accordance with CS 25.813(c)(4)(ii) provided that, as soon as an occupant tries to access and/or open the emergency exit using the required and visible operating handle, the obstruction may be moved away in such a way that the occupant instinctively understands how to complete removal of the obstructive item. Examples of such items are unattached (or loosely attached) soft seat back cushions on side-facing divans, provided that the cushion may be readily moved away and the exit then easily fully opened. Ease of opening from the outside should also be assessed. The exit signs should not be obscured.

Create a new AMC 25.813(e) as follows:

AMC 25.813(e)

Interior Doors

Doors separating occupiable areas of the aeroplane cabin that do not obstruct a possible passenger egress path when closed are not prohibited by CS 25 813(e).

Any such door (*note: lavatory doors are regulated by CS 25.820*) should be openable from both sides without the use of any tool, which means without the need to use any item; it is not acceptable to require the use of even common items such as coins, credit cards, pens etc.

It is acceptable to have a door between a passenger compartment and a passenger emergency exit in contradiction with the prohibition of CS 25.813(e), provided that this door is secured in the open position by means acceptable to the Agency that cannot be overridden except by a maintenance action (i.e. the necessary actions should be such that aeroplane occupants are unlikely to be equipped to perform them).

Create a new AMC 25.854 as follows:

AMC 25.854

Lavatory Fire Protection

The cabin length should be measured parallel to the aeroplane centre line from the most forward to the most aft point accessible to passengers or crew.

Points within in-flight accessible cargo compartments, approved for meeting one of the classifications of CS 25.857, need not be considered.

On the flight deck, the most forward seat reference point (SRP) of the pilots' seats (with the seats adjusted to the most forward possible positions) should be used as the most forward reference point.

AMC — SUBPART F

Create a new AMC 25.1365(b) as follows:

AMC 25.1365(b)

Installation of Cooktops

The following acceptable means of compliance are applicable to cooktops with electrically powered heating elements. Use of other types of heat sources, such as gas, is unlikely to be acceptable. If such a design is desired, the Agency should be contacted for advice.

(1) Suitable means, such as conspicuous element 'on' indicators, physical barriers, or handholds, should be installed to minimise the potential of inadvertent personnel contact with hot surfaces of both the cooktop and cookware. Conditions of turbulence should also be considered.

(2) Sufficient design means should be provided to restrain cookware, including their contents, in place on the cooktop against flight loads and turbulence.

(i) Restraints should be provided to preclude hazardous movement of cookware and contents thereof. These restraints should accommodate the cookware that is approved for use with the cooktop.

(ii) Restraints should be designed to be easily used and effective in service. The cookware restraint system should also be designed in a way that it may not be easily disabled, thus rendering it unusable.

(iii) Appropriate placarding should be installed prohibiting the use of cookware not approved for use with the cooktop.

(3) Appropriate placarding should be installed prohibiting the use of cooktops (i.e. power on any heating surface) during taxiing, take-off and landing.

(4) Suitable means should be provided to address the possibility of a fire starting on the cooktop or in its immediate vicinity. The following two means are acceptable:

(i) Appropriate placarding should be installed that prohibits any heating surface from being powered when the cooktop is unattended (Note: this would prohibit a single person from cooking on the cooktop and intermittently serving food to passengers while any surface is powered). A fire detector should be installed in the vicinity of the cooktop, which provides a warning audible throughout the passenger cabin; moreover, a fire extinguisher of appropriate size and extinguishing agent should be installed in the immediate vicinity of the cooktop. Access to the extinguisher should not be blocked by a possible fire on or around the cooktop. One of the fire extinguishers required by CS 25.851 may be used to satisfy this

requirement if it is located in the immediate vicinity of the cooktop and the total complement of extinguishers is evenly distributed throughout the cabin. If this is not possible, then the extinguisher in the cooktop area should be additional to those required by CS 25.851; or

(ii) An automatic (e.g. thermally activated) system should be installed to extinguish a fire at the cooktop and immediately adjacent surfaces. The agent used in the system should be an approved flooding agent suitable for use in an occupied area. The fire suppression system should have an appropriately located manual override. Activation of the fire suppression system (automatic or manual) should also automatically shut off power to the cooktop.

(5) The surfaces of the galley surrounding the cooktop, which would be exposed to a fire in the cooktop surface or on cookware in the cooktop, should be constructed of materials that comply with the flame penetration resistance requirements of Appendix F, Part III. This requirement, in addition to the flammability ones, is typically required of the materials in these galley surfaces. During the selection of these materials, consideration should also be given to ensure that the flammability characteristics of the materials will not be adversely affected by the use of cleaning agents and utensils used to remove cooking stains.

(6) The cooktop should be ventilated with a system independent of the aeroplane cabin and cargo ventilation system. Procedures and time intervals should be established to inspect and clean or replace the ventilation system to prevent a fire hazard from the accumulation of flammable oils. These procedures and time intervals should be included in the instructions for continued airworthiness as required by CS 25.1529. The ventilation system ducting should be protected by a flame arrester (Note: the applicant may find additional useful information in Society of Automotive Engineers (SAE) Aerospace Recommended Practice (ARP) No 85, Revision E, ARP85E 'Air Conditioning Systems for Subsonic Airplanes' of 1 August 1991).

(7) Means should be provided to contain spilled foods or fluids in a manner that will prevent the creation of a slipping hazard to occupants as well as the loss of structural strength due to aeroplane corrosion.

(8) Cooktop installations should provide adequate space for the user to immediately escape a hazardous cooktop condition.

(9) A means to shut off power to the cooktop should be provided at the galley containing the cooktop and in the cockpit. If one (or more) dedicated switch(es) is (are) provided in the cockpit, smoke or fire emergency procedures should be provided in the AFM to cover their use.

(10) The cooktop should have either a lid that will completely enclose the cooking surface, or a fire blanket of a size sufficient to completely cover the cooking surface should be provided. If a lid is installed, there should be a means to automatically shut off power to the cooktop when the lid is closed. The fire blanket material should be demonstrated to meet the standards of European Standard (EN) 1869:1997, *Fire blankets* or equivalent.

Amend AMC 25.1447(c)(1) as follows:

AMC 25.1447(c)(1)

Equipment Standards for Oxygen--Dispensing Units

(…)

6 A supplemental oxygen supply should be provided for each passenger lying on a bed or a seat that can be converted into a bed. Except for cases where the occupant's head location during sleeping is obvious, a placard indicating the correct sleeping position should be installed, unless the passenger oxygen system is designed to account for any sleeping position.

7 Sufficient illumination should be automatically ensured at each location where supplemental oxygen is provided so that in the event of oxygen mask presentation, the user has sufficient visibility to enable quick donning.

Amend AMC 25.1447(c)(3) as follows:

AMC 25.1447(c)(3)

Equipment Standards for Oxygen--Dispensing Units

~~If~~ It is acceptable that oxygen outlets/units of dispensing equipment are not provided within ~~in a dedicated area, called here 'remote area',~~ an area where people are likely to congregate (for instance a waiting area for lavatory facilities, a bar/lounge area etc.), provided that the applicant ~~should~~ demonstrates that sufficient oxygen-dispensing outlets are within five feet or five seconds reach of the ~~remote~~ area~~(s)~~ and ~~should show~~ that no visual obstruction exists between the potential oxygen users and the outlets, such as curtains or partitions, unless another method of indication (e.g. a light) is provided in the ~~remote~~ area.

There should be at least two outlets and units of dispensing equipment in toilets, washrooms, galley work areas etc. In such areas where an occupancy higher than two persons can be expected, the number of outlets (within the area or within five feet or five seconds reach) should be consistent with the expected occupancy.

In case of a shower, there should be an oxygen outlet and unit of dispensing equipment immediately available to each shower occupant without stepping outside the shower (reaching through an opened shower cubicle door is acceptable).

AMC — SUBPART G

Amend AMC 25.1541 as follows:

AMC 25.1541

Markings and Placards –— General

Markings or placards should be placed close to or on (as appropriate) the instrument or control with which they are associated. The terminology and units used should be consistent with those used in the

Flight Manual. The units used for markings and placards should be those that are read on the relevant associated instrument.

Publications which are considered to provide appropriate standards for the design substantiation and certification of symbolic placards may include, but are not limited to, 'General Aviation Manufacturers Association (GAMA) Publication No. 15 — Symbolic Messages', Initial Issue, 1 March 2014.

AMC — APPENDICES

Create a new AMC to Appendix S, S25.10(a) as follows:

AMC to Appendix S, S25.10(a)

Interior Doors on Non-Commercially Operated Aeroplanes

An assessment should be made of the cabin features adjacent to each door in order to ensure that there is sufficient clearance on each side of the doors during all phases of flight such that their frangibility features, as required by S25.10(a)(2), will work as 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 text 'without the aid of any tool' in S25.10(a)(4) should mean: without the need to use any item. It is not acceptable to require the use of even common items such as coins, credit cards, pens etc.

If several interior doors requiring flight deck indication of incorrect positioning, as required by S25.10(a)(5), 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 are met:

(1) 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.

(2) There is a simultaneous indication provided to a required cabin crew member which allows easy identification of the interior door being in the incorrect position. An associated procedure for coordination between the flight and cabin crew should be included in the AFM.

If the aeroplane is also equipped with one or more internal doors that are compliant with CS 25.813(e), i.e. that do not cross any egress path, the possibility that escaping passengers may believe that such doorway leads to an egress path should also be taken into consideration. In order to reduce the risk of confusion, it should be assured that such doors remain closed during taxiing, take-off and landing. Inclusion of the position of these doors in the indication means required by S25.10(a)(5) is an acceptable means to provide this assurance.

The indication provided to the flight crew, as required by S25.10(a)(5), should be triggered without delay if the door is not in the safe position during any of the taxiing, take-off, approach and landing flight phases. When preparing for landing, the indication should be triggered during the descent phase, early

enough to enable the crew to take appropriate action before entering the approach phase. Appropriate procedures for crew action, in the event that the door is signalled as being not secured in the safe position, should be established.

For the purpose of the briefing required by S25.20(a)(6), a description of the operation of the internal door, including its frangibility features, should be available to the flight crew.

Create a new AMC to Appendix S, S25.10(b) as follows:

AMC to Appendix S, S25.10(b)

Interior Doors on Commercially Operated Aeroplanes

The provisions of S25.10(b) only apply to aeroplanes with an approved passenger capacity of 19 or less. AMC 25.854 provides guidance on how to determine cabin length.

An assessment should be made of the cabin features adjacent to the door in order to ensure that there is sufficient clearance on each side of the door during all phases of flight such that the frangibility features of the door, as required by S25.10(b)(5), will work as 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.

Both means required by S25.10(b)(6)(iii) for securing the door in the open position for taxiing, take-off, approach and landing should be part of the automatic opening system required by S25.10(b)(6)(ii) and not involve any passenger or crew action when functioning properly.

If the aeroplane is also equipped with one or more internal doors that are compliant with CS 25.813(e), i.e. that do not cross any egress path, the possibility that escaping passengers may believe that such doorway leads to an egress path should also be taken into consideration. In order to reduce the risk of confusion, it should be assured that such doors remain closed during taxiing, take-off and landing. Inclusion of the position of these doors in the indication means required by S25.10(b)(8) is an acceptable means to provide this assurance.

The indication provided to the flight crew, as required by S25.10(b)(8), should be triggered without delay if the door is not in the safe position (i.e. open and secured) during any of the taxiing, take-off, approach and landing flight phases. When preparing for landing, the indication should be triggered during the descent phase, early enough to enable the crew to take appropriate action before entering the approach phase. Appropriate procedures for crew action in the event that the door is signalled as being not secured in the safe position, should be established.

For the purpose of the briefing required by S25.10(b)(9), a description of the operation of the internal door, including its frangibility features, should be available to the flight crew.

Create a new AMC to Appendix S, S25.10(c) as follows:

AMC to Appendix S, S25.10(c)

Isolated Compartments

(a) Cabin Compartments

(1) 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 need not in any case be considered as isolated. AMC 25.854 provides guidance on how to determine cabin length.

S25.10(c) requires that a compartment in which a fire would not be directly or quickly detected by occupants of another compartment is equipped with a smoke/fire detection system. 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 basic 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. 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.

(2) Compartments occupied for the majority of the flight time

S25.10(c) exempts isolated compartments (as defined in Paragraph (1) 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 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 compartment), or because occupancy for the majority of the flight time cannot be envisaged. 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 need not 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 need not be considered an isolated compartment;

(D) crew rest compartments; and

(E) galley compartments.

(ii) On the other hand, a compartment, unless meeting one of the criteria above, will be accepted as being occupied for the majority of the flight time, thus providing for smoke/fire detection by the occupants, if any of the following conditions are met:

(A) all required cabin crew seats are located in the compartment;

(B) the compartment contains a crew station that due to its specialised purpose, is likely to be occupied for the majority of the flight time;

(C) there is no seat and no stowage in the compartment (e.g. a connecting corridor); and

(D) the number of seats in the 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 table below.

Total Number of seats installed on the aeroplane approved for occupancy during taxiing, take-off and landing	A compartment is accepted as being occupied for the majority of the flight time if at least the following number of taxiing, take-off and landing seats are installed in the compartment
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).

(3) 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, means should be provided to enable a person entering the compartment to readily gain visibility of the interior, by means such as:

(A) a conveniently located, easy to see and use lighting control;

(B) a flashlight within close proximity to the entrance of the compartment; or

(C) automatic illumination in the event of a smoke/fire detection system (if installed) triggering.

(ii) At least one readily accessible handheld fire extinguisher should be available for use in each cabin compartment isolated from the remainder of the cabin. Fire extinguishers required by CS 25.851(a) may be used for this purpose. On the other hand this may also lead to installing 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

For complex interiors with many isolated compartments remote from each other, there should be a means allowing the flight or cabin crew to readily identify in which compartment smoke/fire has been detected.

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.

Create a new AMC to Appendix S, S25.10(d) and (e) as follows:

AMC to Appendix S, S25.10(d) and (e)

Deactivation of existing Emergency Exits

1. General

The distance from a passenger seat to an exit should be calculated in accordance with AMC 25.807.

Furthermore, the acceptable means of compliance in AMC 25.807 regarding aeroplanes with an approved seating capacity of 19 or less remain applicable to aeroplanes using the provisions of S25.10(d).

When deactivation of one or more emergency exits results in an emergency exit arrangement that is asymmetrical relative to the aeroplane centre line, the acceptable seating capacity for each cabin zone should be determined considering the emergency exits remaining available on each side of the fuselage separately, i.e. following a similar methodology as the one used in FAA AC 25.807-1, *Uniform distribution of exits*, 13 August 1990. For example, if the remaining functional forward exits of an aeroplane are arranged in a way that the centre line of the left-hand exit is at fuselage station (FS) 100, and the right-hand exit is at FS 230, the aeroplane should be firstly analysed as if the forward exits were at FS 100, and secondly it should be analysed again as if the forward exits were at FS 230. Both analyses should comply with the requirements of S25.10(d) in order for the aeroplane to be acceptable.

2. Examples

The following examples illustrate the analysis method to be followed when examining the acceptability of various emergency exit deactivation schemes on an aeroplane that is originally type-certified with two pairs of Type C exits (rated at 55 passengers for each pair) at the forward and aft limits of the cabin, and a single pair of overwing Type III exits (rated at 35 passengers). In accordance with CS 25.807, this emergency exit layout will have a possible maximum approved passenger capacity of 145 (55 + 35 + 55). It is assumed that the aeroplane manufacturer has received approval for this number of passengers.

The distance between the nearest exit edges of the two pairs of Type C exits is 20 m (65.7 ft). The overwing exits pair's forward edges are 8 m (26.3 ft) from the rear edges of the forward Type C exit pair.

The figures below provide additional clarification on the methodology to be used and the resultant limitations.

A cabin area that should not include any crew or passenger seats that can be occupied during taxiing, take-off and landing is referred to as a 'stay-out zone', coloured pink in the illustrations below. The hatched/yellow areas in the illustrations below are referred to as 'additional stay-out zones' and should also not include any crew or passenger seats that can be occupied during taxiing, take-off and landing. Seats located within these latter zones do meet the criteria of CS 25.807(e)(2)(i) but do not meet the criteria of CS 25.807(e)(2)(ii). In other words, although these zones are located sufficiently close to emergency exits to meet the basic emergency exit egress distance requirements on both sides of the fuselage, an occupant of one of these seats

would be forced to traverse a cabin area that does not meet these requirements, i.e. a stay-out zone, in order to egress the aeroplane.

Example 1

In the first example, only the left hand (LH) overwing Type III exit is deactivated.

Identification of stay-out zones

No stay-out zone needs to be identified in the cabin, if any possible passenger seat location will be no more than 9.14 m (30 ft) from the nearest exit on one side of the fuselage, and no more than 13.72 m (45 ft) from the nearest exit on the other side of the fuselage, i.e. in compliance with S25.10(d)(3).

Calculation of the basic passenger seating capacity limitations set by S25.1(a)

In the case of non-commercial operations, in accordance with S25.1(a), the passenger capacity will have an upper possible limit of 73 passengers (1/2 of 145 (55 + 35 + 55) rounded up), i.e. one half of the maximum approved passenger seating capacity of the type-certified aeroplane having all exits functional.

In the case of commercial operations, in accordance with S25.1(a), the passenger capacity will have an upper possible limit of 48 passengers (1/3 of 145 (55 + 35 + 55) rounded down), i.e. one third of the maximum approved passenger seating capacity of the type-certified aeroplane having all exits functional. Additionally, there will be an upper possible limit of 30 passengers seated forward or aft of the overwing exits (1/3 of 90 (55 + 35)), i.e. one third of the maximum approved passenger seating capacity for each cabin zone of the type-certified aeroplane having all exits functional.

Calculation of additional passenger seating limitations due to exit deactivation

Firstly, a zonal analysis is conducted on the right side of the fuselage in accordance with S25.10(d). Two zones are represented by the exits on this side (all original emergency exits remain functional).

The allowable number of seats between the forward Type C exit and the overwing exit is limited to one half of the sum of the ratings of the exits that bound the zone: 1/2(55 + 35) = 45.

The same limit is valid also for the zone between the overwing exit and the rearmost Type C exit.

Secondly, a zonal analysis is conducted on the left side of the fuselage in accordance with X25.10(d). There is only one zone represented by the remaining functional exits on this side. The allowable number of passenger seats between the forward and aft Type C exits is again limited to one half of the sum of the exit ratings that bound the zone: 1/2(55 + 55) = 55.

The passenger seating locations for taxi, take-off and landing should simultaneously satisfy all basic limitations set by X25.1(a) and both of the zonal analyses in accordance with X25.10(d).

In the case of non-commercial operations, this means that the maximum passenger seating capacity is limited to 55 (i.e. in this case, the limitation resulting from the left-side fuselage zonal analysis is most constraining and defines the maximum seating capacity of the aeroplane) and a maximum of 45 passenger seats located either forward or aft of the remaining functional overwing exit may be occupied for taxi, take-off and landing.

However, for commercial operations, an overriding consideration applies due to the fact that there is a non-compliance with CS 25.807(f)(4) on the left side of the fuselage, and the provisions of S25.10(d) only apply to non-commercial operations. The seating capacity of the example aeroplane in commercial operation will thus be limited to 19 seats because CS 25.807(f)(4) only applies to aeroplanes for which more than one exit pair is required. However, there will be no limitation on the passenger seating location for taxiing, take-off and landing, as explained in AMC 25.807.

Example 2

In the second example, both left hand (LH) and right hand (RH) overwing Type III exits are deactivated. The aeroplane has thus only two pairs of remaining functional Type C exits located at either end of the cabin.

Identification of stay-out zones

A stay-out zone is identified in the middle of the cabin, where a passenger seat that can be occupied during taxiing, take-off and landing would not be in compliance with S25.10(d)(3), i.e. would be further than 9.14 m (30 ft) from the nearest exit, on both sides of the fuselage. The exact limitation on the seat installation location in order to respect the stay-out zone should be calculated using the longitudinal measurement method as explained in AMC 25.807.

Calculation of the basic passenger seating capacity limitation set by S25.1(a)

In the case of non-commercial operations, in accordance with XS25.1(a), the passenger capacity will have an upper possible limit of 73 passengers (1/2 of 145 (55 + 35 + 55) rounded up), i.e. one half of the maximum approved passenger seating capacity of the type-certified aeroplane having all exits functional.

In the case of commercial operations, in accordance with S25.1(a), the passenger capacity will have an upper possible limit of 48 passengers (1/3 of 145 (55 + 35 + 55) rounded down), i.e. one half of the maximum approved passenger seating capacity of the type-certified aeroplane having all exits functional. Additionally, there will be an upper possible limit of 30 passengers seated forward or aft of the overwing exits (1/3 of 90 (55+35)), i.e. one third of the maximum approved passenger seating capacity for each cabin zone of the type-certified aeroplane having all exits functional.

Calculation of additional passenger seating limitations due to exit deactivation

In this example, the arrangement of the remaining functional exit is symmetrical on either side of the aeroplane centre line, hence, no separate LH and RH zonal analyses are required, and only one cabin zone remains.

The zonal analysis, in accordance with S25.10(d), results in the number of seats that may be occupied during taxiing, take-off and landing between the forward and aft Type C exits, limited to one half of the sum of the ratings of the exits that bound the zone: i.e. 1/2 (55 + 55) = 55.

The passenger seating locations for taxiing, take-off and landing should simultaneously satisfy all basic limitations set by S25.1(a) and the zonal analysis in accordance with S25.10(d).

Therefore, for non-commercial operations, a maximum total of 55 passenger seats may be occupied during taxiing, take-off and landing, in any combination of individual locations forward or aft of the identified stay-out zone.

For commercial operations, as in Example 1, the seating capacity of the aeroplane will be limited to 19, due to non-compliance with CS 25.807(f)(4), on both sides of the fuselage this time. However, as also explained in Example 1, the total of 19 passenger seats that can be occupied during taxiing, take-off and landing may be in any combination of locations forward or aft of the identified stay-out zone.

Example 3

In the third example, the rearmost LH Type C exit is deactivated. The aeroplane has thus one pair of functional forward Type C emergency exits and one pair of functional overwing Type III emergency exits, and a functional aft Type C emergency exit on the RH side only.

Identification of stay-out zones

No stay-out zone can be identified in the cabin, i.e. any possible passenger seat location will be no more than 9.14 m (30 ft) from the nearest exit on one side of the fuselage, and no more than 13.72 m (45 ft) from the nearest exit on the other side of the fuselage.

Calculation of the basic passenger seating capacity limitations set by S25.1(a)

In the case of non-commercial operation, in accordance with S25.1(a), the passenger capacity will be limited to 73 passengers (1/2 (55+35+55) rounded up), i.e. one half the maximum approved passenger seating capacity of the type certified aeroplane with all exits functional.

In the case of commercial operation, in accordance with S25.1(a), the passenger capacity will have an upper possible limit of 48 passengers (1/3 (55+35+55) rounded down), i.e. one third the maximum approved passenger seating capacity of the type certified aeroplane with all exits functional. Additionally, there will be an upper possible limit of 30 passengers seated forward or aft of the overwing exits (1/3 (55+35)), i.e. one third of the maximum approved passenger seating capacity for each cabin zone of the type certifited aeroplane with all exits functional.

Calculation of additional passenger seating limitations due to exit deactivation

Firstly, a zonal analysis is conducted on the right side of the fuselage, in accordance with S25.10(d). Two zones are represented by the remaining functional exits on this side (all original emergency exits remain functional).

The allowable number of seats for installation between the forward Type C and the overwing exit is limited to one half of the sum of the ratings of the exits that bound the zone: 1/2 (55 + 35) = 45.

The same limit is also valid for the zone between the overwing emergency exit and the rearmost Type C exit.

Secondly, a zonal analysis is conducted on the left side of the fuselage. Again, two zones are represented by the remaining functional emergency exits on this side, but this time, one zone is a so-called dead end zone.

As for the right side, it is acceptable to install 45 seats between the forward Type C and the overwing exit: 1/2 (55 + 35) = 45.

In the dead end zone aft of the overwing exit, it is acceptable to install a maximum of 18 seats (1/2 of 35 rounded up).

The passenger seating locations for taxiing, take-off and landing should simultaneously satisfy all basic limitations set by S25.1(a) and both of the zonal analyses in accordance with S25.10(d).

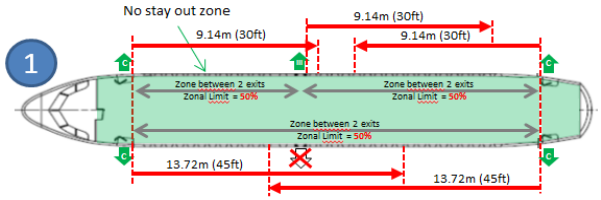
Therefore, for non-commercial operations, this results in a maximum total seating capacity of 63 when it simultaneously satisfies the upper limit for each zone, i.e. 45 for the forward zone and 18 for the aft zone.

In case of commercial operations, the total capacity of the aeroplane will be limited to 48 passengers, not exceeding 30 passengers forward of and 18 aft of the overwing exits.

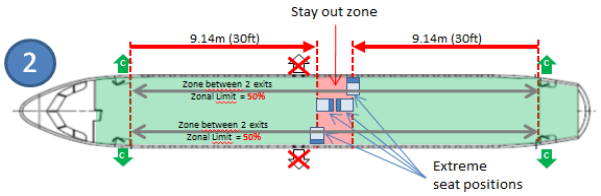
Further examples

In addition to Examples 1, 2 and 3 above, further examples of exit deactivation for the same basic aeroplane are illustrated, and the resultant allowable passenger seating restrictions are summarised.

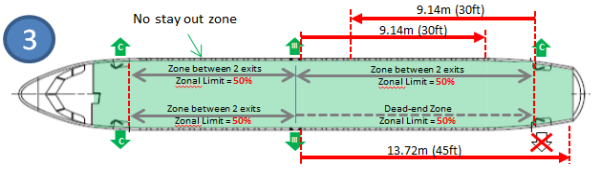
The principles evident from these examples can be used to determine zonal capacities and stay-out zones for any aeroplane.



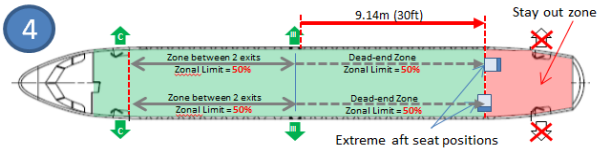
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	RH: 50% [90+90] = 90 LH: 50% [110] = 55	55
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Distance>60ft: No zonal analysis required	19 (Distance>60ft)
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



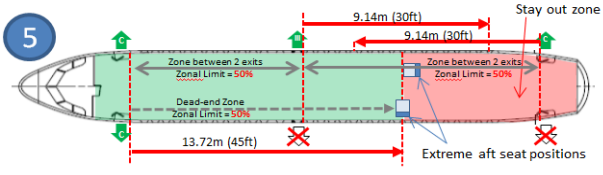
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	RH: 50% [110] = 55 LH: 50% [110] = 55	55
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Distance>60ft: No zonal analysis required	19 (Distance>60ft)
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



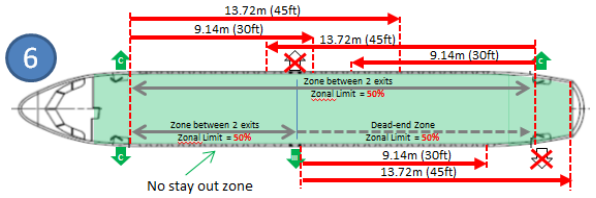
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	RH: 50% [90+90] = 90 LH: 50% [90+35] = 63	63
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	RH: 50% [90+90] = 90 LH: 50% [90+35] = 45+18 1/3* [55+35] = 30 / zone	48 (30+18)
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



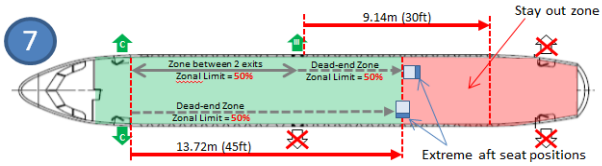
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	RH: 50% [90+35] = 63 LH: 50% [90+35] = 63	63
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	RH: 50% [90+35] = 45+18 LH: 50% [90+35] = 45+18 1/3* [55+35] = 30 / zone	48 (30+18)
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



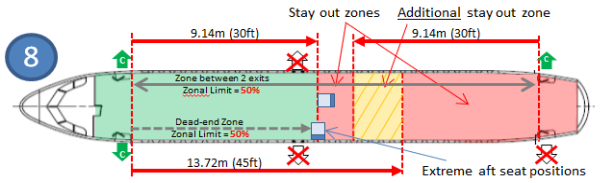
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	Only one pair of exits: No zonal analysis required	19 (25.807 limit with only one pair)
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Only one pair of exits: No zonal analysis required	
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



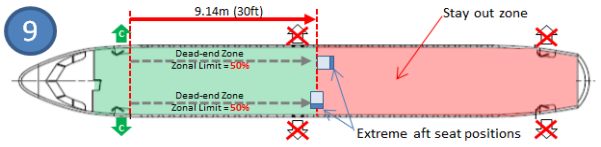
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	RH: 50% [110] = 55 LH: 50% [90+35] = 63	55
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Distance>60ft: No zonal analysis required	19 (Distance>60ft)
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



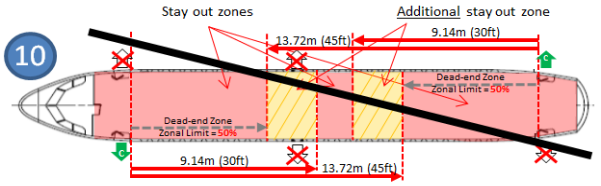
	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	Only one pair of exits: No zonal analysis required	19 (25.807 limit with only one pair)
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Only one pair of exits: No zonal analysis required	
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	Only one pair of exits: No zonal analysis required	19 (25.807 limit with only one pair)
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Only one pair of exits: No zonal analysis required	
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	Only one pair of exits: No zonal analysis required	19 (25.807 limit with only one pair)
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Only one pair of exits: No zonal analysis required	
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized



	Operations	Eligibility limit	Zonal limits	Total Limit
1	Non-Commercial	1/2 TC = 73	Only one pair of exits: No zonal analysis required	0 Only stay out zones
2	Commercial Low occupancy	1/3 TC = 48 1/3 per zone	Only one pair of exits: No zonal analysis required	
3	Commercial (>1/3 TC + per zone)	Not Authorized	Not Authorized	Not Authorized

Create a new AMC to Appendix S, S25.20(a)(1) as follows:

AMC to Appendix S, S25.20(a)(1)

Flammability of Bed Mattresses

Mattresses of beds that are convertible to/from seats, regardless of their location in the aeroplane, and irrespective of whether or not the seat configuration is approved for occupancy during taxiing, take-off and landing, should meet the criteria of CS-25, Appendix F, Part II.

As required by CS-25, Appendix F, mattress foam shall be tested for 12,7-mm (1/2-in.) thickness. If the mattress consists of two or more foams glued together, the foam specimen should consist of two 6.34-mm (1/4-in.) (three layers of 4.2 mm (1/6 in.), etc.) pieces glued together. Three specimens should be made for each combination of foams that are glued together in the production mattress. Any other production mattress components that are glued together should also be tested together.

If such specimens do not meet the test criteria of CS-25, Appendix F, Part I, it is acceptable to test each production mattress component separately, including a sheet of glue, using the test criteria of Appendix F, Part I.

Additionally, the Bunsen burner is then to be applied at three separate corners of the production mattress with all its components. The three-corner test need not be conducted if the cushion passes the tests of CS-25, Appendix F, Part II.

Create a new AMC to Appendix S, S25.20(b) as follows:

AMC to Appendix S, S25.20(b)

Access to Type III and IV Emergency Exits

This paragraph provides guidelines regarding the criteria under which an item, although constituting an obstruction that does not comply to CS 25.813(c), may not be considered as such because per design and procedure, it is ensured that the obstruction is entirely removed when needed for safety (S25.20(b)(1)).

In addition to the exceptions set in Section 2 — Deployable features of AMC 25.813(c), an item which can be deployed by a crew member or passenger into the region defined by CS 25.813 (c)(4)(i) or into the passageway required by CS 25.813 (c)(1), (2) or (3), but which when stowed is no longer in either of these areas, is acceptable if there is enough assurance that the item will be stowed when needed. Such assurance may be assumed when all following conditions are met:

(1) A position monitoring system is installed, which detects that the item is not properly stowed, and triggers both an alerting system in the cabin and a visual indication to the flight crew if the item is not properly stowed before entering any of the taxiing, take-off, approach and landing phases.

(2) The alerting system in the cabin, required in Paragraph (1), includes an aural device which sounds continuously in all areas of the passenger cabin (it should be loud enough to clearly act as an irritant, thus assuring that occupants will stow the obstruction, but not so loud as to annoy the flight crew), as well as a prominent electrically illuminated sign showing an appropriate text message or pictogram, in the immediate proximity of the relevant emergency exit.

(3) For aeroplanes where at least one cabin crew member is required to be on board all flights, the alert defined in Paragraph (2) may also be directed to a cabin crew member.

(4) The alerting system in the cabin, described in Paragraph (2), is triggered without delay if the deployable item is moved away from the safe position during any of the taxiing, take-off, approach and landing flight phases, or if upon entering these phases, the deployable item is not stowed in the safe position. When preparing for landing, the alerting system is triggered at a point that allows ample time for a cabin occupant to restow the deployable item before landing. It should be considered that the cabin occupant needs to move within the cabin to reach the deployable item, therefore, the alerting system should be triggered at the latest during descent, allowing enough time prior to entering the approach phase. The aural and visual alerts should both remain on until the obstacle is properly stowed.

(5) The visual indication provided to the flight crew, described in Paragraph (1), is triggered without delay if the deployable item is moved away from the safe position during any of the taxiing, take-off, approach and landing flight phases, or if upon entering these phases, the deployable item is not stowed in the safe position. When preparing for landing, the visual indication is triggered during the descent phase, early enough to enable the crew to take appropriate action before entering the approach phase.

(6) The total failure of both the position monitoring and alerting system (failure to alert both in the cabin and cockpit that a deployable item is not properly stowed) is not more probable than remote.

(7) Instructions are given to the passengers and cabin crew (if any), by means of appropriate placards and a preflight briefing, that the obstacle should be stowed before entering any of the taxiing, take-off, approach and landing phases. The preflight briefing (which could be part of a regular briefing) should describe the position monitoring and alerting system, as well as the necessary response by the passengers.

(8) A description of the position monitoring and alerting system is made available to the flight crew, and the AFM includes a limitation requiring a preflight passenger briefing covering the aspects described in Paragraph (7). This should also include the appropriate normal procedure ensuring that the cabin is ready (no obstruction indicated) prior to landing, and that the crew takes all necessary actions when the visual indication, as defined in Paragraph (5), is triggered.

(9) The emergency exit provided when the obstruction in its most adverse position(s) is at least as effective as a Type IV exit unless it can be shown that following any single failure, an exit at least as effective as a Type IV exit can be obtained by simple and obvious means. If the obstructing item is a seat, the normal seat operating controls (e.g. track, swivel, recline etc.) may be considered as means meeting the simple and obvious requirement, provided that the controls remain visible to a person approaching the seat and are easily useable without sitting on the seat, when the seat is in any possible obstructing condition.

(10) When assessing the effectiveness of the Type IV exit resulting from any of the conditions allowed by Paragraph (9), the requirements of CS 25.807(a)(4), CS 25.809(b) and CS 25.813(c)(1) should be considered.

Create a new AMC to Appendix S, S25.30(a) as follows:

AMC to Appendix S, S25.30(a)

Width of Aisle

For compliance with the 'Width of Aisle' requirement, the following applies:

(1) An obstacle in the passageway is considered easily surmountable if the aisle width reduction it creates may be rapidly negotiated by a 5th percentile female or 95th percentile male.

(2) Negotiating of an obstacle may require the removal and/or movement of more than one item, provided that this can be performed rapidly.

(3) If an obstacle is stepped on, it should be capable of withstanding without failure a vertical step force of 222 daN (500 lbs) applied at the most adverse stepping location.

(4) When assessing compliance, the applicant should select the most adverse in-flight configuration(s). The selection should include all possibilities regardless of subjective issues, such as the likelihood that passengers may consider the configuration advantageous. The possibility of entrapment (e.g. feet, hands etc.) during negotiating of the obstacle should be included in the assessment and selection of adverse in-flight configurations. Maintaining gaps of less than 3.5 cm (1.38 in.) is considered acceptable to eliminate the risk of entrapment. Items such as drawers or

stowage doors need not to be considered opened in the aisle. Each interior door may be considered open unless another position of the door might interact with the movement of an obstacle out of the aisle. In that case, all possible interactions between the door and the obstacle should be assessed. In general, items need only be considered in their most adverse detent or locked position. However, the specific aisle obstruction may dictate other positions to be considered.

(5) For the purpose of showing compliance, the applicant may use tests, analyses supported by test data, or, where appropriate, inspections.

(6) In principle, the total time required for a crew member to travel from the forwardmost point in the cabin to the rearmost point, with all aisle obstacles in their most adverse positions, should not exceed by more than 30 seconds the time it would take without the obstacles in place. However, the cabin may be divided into zones, provided that each zone includes the quantity and type of emergency equipment adequate for firefighting, and that it can be substantiated that at least one cabin crew member is likely to occupy that zone during the majority of the flight. It should be shown that the time required for a cabin crew member to travel from the forwardmost point to the rearmost point of each zone, with all aisle obstacles in their most adverse positions, will not exceed by more than 30 seconds the time it would take without the obstacles in place.

(7) If an unobstructed passageway exists as an alternative to the obstructed one (e.g. aeroplanes with two aisles), it may be acceptable for this alternative route to be used when showing compliance. Such acceptability will depend on a case-by-case assessment of the degree to which such an alternative route would be obvious to the crew member.

Note: interior doors are not addressed by the requirements of S25.30(a) but rather by the requirements of S25.10(a) and (b).

Create a new AMC to Appendix S, S25.30(b) as follows:

AMC to Appendix S, S25.30(b)

Firm Handholds

Where the cabin layout is similar to a standard airline layout, firm handholds as normally expected for such seating areas should be provided.

Where closely spaced firm handholds cannot be easily provided, the 'Firm Handholds' requirement can be considered as complied with, provided that the following conditions are met:

(1) there should be a recommendation to passengers to remain seated with seat belts fastened, which may be a placard or a required (i.e. specified in the AFM) pre-flight briefing;

(2) there should be at least one route through each area that provides firm handholds to enable passengers to reach their designated seats; in these areas:

(i) firm handholds should be mounted at least 66 cm (26 in.) high; and

(ii) the distance between firm handholds should not be greater than 2.15 m (84 in.);

(3) wherever aisles are not bordered by seats, it is acceptable that occupants may steady themselves by leaning on sidewalls or other interior components; and

(4) in any case, the applicant shall demonstrate that items used as firm handholds are structurally adequate to perform this function.

Create a new AMC to Appendix S, S25.40(b) as follows:

AMC to Appendix S, S25.40(b)

Briefing Card Placard

The instructions that may be reported on the briefing card referred to in S25.40(b) are limited to the instructions necessary to restore the configuration of the passenger cabin to that approved for taxiing, take-off and landing. All other placards required by CS-25 are excluded from the provisions of S25.40(b).

For example, and where applicable, a briefing card may be used to deliver information related to setting seats in the upright position, stowing leg rests/armrests, repositioning 'high–low' position tables, opening/closing doors, installing crash pads, etc.

The content added to the briefing card to cover information conventionally conveyed via placarding, and the means to provide accessibility to this information will need to be approved as part of the type design. However, it may be desired to include additional safety information on the same briefing card. This may be due to operational requirements for a briefing card, or may be at the applicant's or customer's discretion. This is acceptable, and this additional information will not be subject to approval as part of the type design. However, limitations on the presentation of this additional information on the briefing card (e.g. size, style, relative location) may need to be stated in the type design in order that both sets of information are maintained appropriately conspicuous to the passengers.

When design solutions are proposed using placards that make reference to a briefing card for further instructions, the following should be considered:

(1) Individual placards on each and every seats may be replaced by a simplified placarding referring to the briefing card. For example: 'Refer to the briefing card to configure cabin/seat/table/leg rest for taxiing, take-off and landing'.

(2) Alternatively, one single placard stating 'Moveable items in this area should be configured in accordance with the briefing card for taxiing, take-off and landing', and visible from each seated position of a group of seats, may be used.

(3) The briefing card should be demonstrated to be accessible from each passenger seat. A dedicated stowage (e.g. pocket) easily recognisable by a seated passenger, or when approaching the seat, shall be provided. The briefing card should be within easy reach of each passenger with their seat belt fastened, except in some cases where this may be impracticable. For instance, it may be acceptable that a passenger occupying the centre place of a three-place divan is not able to reach the briefing card with their seat belt fastened. In such a case, the Agency may accept that either the left hand (LH) or right hand (RH) place of the divan will mostly be occupied, and that this passenger's access to the briefing card will provide him/her with the required awareness of necessary preflight and landing actions.

(4) The briefing card information should be clear and simple. It is expected that the additional space offered by the briefing card, relative to conventional placarding, will allow applicants to provide more easily understandable safety instructions; the use of pictograms is also authorised.

Create a new AMC to Appendix S, S25.40(c) as follows:

AMC to Appendix S, S25.40(c)

Seats in Excess

S25.40(c) requires the installation of a placard, adjacent to each possible passenger boarding door, on aeroplanes which have a greater number of seats approved for occupancy during taxiing, take-off and landing than the maximum certified passenger seating configuration. It may be acceptable that the selection of which seats to occupy is at the operator's/passenger's discretion, or constraints may exist for instance due to the zonal limitations set by S25.1(a)(2), or the varying maximum certified passenger seating configurations and/or direct-view limitations for an aeroplane with different, reconfigurable, cabin designs approved for private versus commercial transport operations. In such cases, the placard should indicate limitations of the allowable seating occupancy for taxiing, take-off and landing, as appropriate, for each cabin zone, and not just for the aeroplane as a whole; moreover, different indications should be provided with reference to the different type of operations that may be performed (non-commercial/commercial).

Additionally, if it is decided to help passengers in selecting acceptable seating locations by means of markings on a seat or seats, a local placard (text or symbolic), easily readable by a passenger approaching/seated on each such seat, should be provided. The placard should be of adequate size for easy readability.

Create a new AMC to Appendix S, S25.50(a)(2) as follows:

AMC to Appendix S, S25.50(a)(2)

Cabin Attendant Direct View

For commercial operations, compliance with CS 25.785(h)(2) may be shown based on the criteria of FAA AC 25.785-1B, *Flight attendant seat and torso restraint system installations*, 11 May 2010, with the following deviations from Section 10 thereof:

(1) Subparagraph 10a(2) is amended to read as follows:

'(2) Each floor level exit adjacent to a required crew member seat';

(2) Subparagraph 10a(3) is amended to read as follows;

'(3) At least 50 % of the total number of passenger seats authorised for occupancy during taxiing, take-off and landing.';

(3) Subparagraph 10a(4) is amended to read as follows:

'(4) At least 25 % of the passenger seats in each visually divided zone of four or more passenger seats.'; and

(4) Subparagraph 10b(3)(a) is amended to read as follows:

'(a) A person seated in the seat is visible when they make any upper-body movement, such as moving their arm over their head or sideways, including leaning, while belted on their seat.'.

Create a new AMC to Appendix S, S25.50(b) as follows:

AMC to Appendix S, S25.50(b)

Stowage Compartment Latching Mechanisms

(1) The design of latching mechanisms in compliance with CS 25.785 and CS 25.787 may be optimised as follows:

(i) *Cabin Crew Member Areas*: cabin crew member areas are those areas in the passenger cabin where cabin crew members may be seated during taxiing, take-off and landing (these are typically zones in proximity to floor level emergency exits, although other areas may exist). To protect flight attendants from being struck by items dislodged from galley stowage compartments, it is common practice to install additional restraint devices (dual latching devices or equivalent) to each stowage compartment located within a longitudinal distance equal to three rows of seats fore and aft of the cabin attendant seats. However, the following additional considerations may be used:

(A) a longitudinal distance of two meters may be used in case the 'three rows' criterion may be difficult to assess due to widely spaced seating; and

(B) under-seat and overhead stowage bins need not be considered.

(ii) *Non-TTOL Areas*: non-TTOL areas are zones, separated from the remainder of the cabin by means of a door during taxiing, take-off and landing (TTOL), in which no seat is installed (passenger or crew member) that may be occupied during taxiing, take-off and landing, and which do not include any part of any possible egress route from the aeroplane (such areas may be for example lavatories, washrooms, bedrooms, closed galleys, etc.). In such areas, a single latch mechanism for stowage compartments is acceptable, provided that the door separating this area from the rest of the cabin is shown to be capable of staying securely closed under the applicable emergency landing conditions of CS 25.561 with an additional load, uniformly distributed on the door, equal to the highest placarded compartment mass inside that area. Such single latch mechanisms need not be designed to account for wear and deterioration expected in service.

(2) The following is provided as a clarification of the considerations to be followed when designing latching mechanisms, as well as of the means by which wear and deterioration expected in service may be substantiated:

(i) *Single Latch*: a single latch is a latching mechanism capable of retaining a load determined by the specified maximum flight, ground and emergency landing load conditions.

(ii) *Double Latch*: a double latch is a latching mechanism composed of two independent single latching mechanisms each of which is capable of retaining a load determined by the specified maximum flight, ground and emergency landing load conditions. It is acceptable that a single operating mechanism (e.g. handle) operates with two independent latching mechanisms at the same time.

(iii) *Incorrect Latching Indication*: all latch mechanisms should be provided with a means to indicate incorrect latching. This means should provide a clear optical indication, easily visible to anyone in the vicinity of the incorrectly latched item, whenever a latching mechanism is improperly engaged. In the case of a double-latch system, a single incorrect latching indication may be used to show the position of the two latches if it can be demonstrated

that the failure of either latch, or both latches, to properly engage cannot result in an indication of correct compartment latching.

(iv) *Wear and Deterioration*: double latching is a means of compliance to the 'wear and deterioration' requirement. Where double latches are installed, there is no need to further demonstrate resistance to wear and deterioration. Wear and deterioration of single latches should be demonstrated by means of test evidence, or by analysis based on test evidence, indicating that latch operation, as intended by design, will be maintained following a simulation of full service life. A design life of 20 000 latch cycles may be used except if the Agency considers that the expected use of the aeroplane justifies a higher endurance substantiation. Demonstration of a 20 000-cycle design life can be accomplished by submitting the latch to a 100 000-cycle test representative of operational use, and by verifying after the test that the latch is still able to operate as intended, and is capable of withstanding ultimate load without failure.

(3) All these considerations regarding latching mechanisms do not apply to compartments not accessible in flight for which a special tool is needed to gain access to (e.g. maintenance panel, access panels, etc.).

4. Regulatory impact assessment (RIA)

4.1. Issues to be addressed

CS-25 is applicable to all turbine-powered large aeroplanes. As most of those aeroplanes are used by airlines, the requirements of CS-25 have been drafted taking into account large transport aeroplanes, featuring cabin interiors equipped for the commercial carriage of relatively high numbers of passengers.

All the so-called 'business jets', having a seating configuration of more than nine and a maximum certified take-off weight greater than 5 670 kg, are certified according to the same requirements of CS-25, but feature interiors differing greatly from the airliners interiors, and carry passengers who are often quite familiar with air transport.

Similarly, when a large transport aeroplane initially designed for commercial air transport is customised as an executive aeroplane, CS-25 is still the applicable CS, which, however, does not always provide appropriate rules for the interior design of the executive aeroplanes.

Typical issues which are not addressed by CS-25, or are not adequate for executive aeroplanes, include:

— distance from passenger seats to emergency exits;

— deactivation of emergency exits;

— seats in excess;

— in-flight only seats;

— doors between passenger compartments;

— creation of isolated compartments;

— installation of showers;

— installation of cooktops;

— in-flight width of aisles;

— need for firm handholds in areas away from repetitive seat rows;

— direct view in complex cabin layouts;

— access to Type III and IV emergency exits on aeroplanes with a small cabin;

— door latching mechanisms for stowage compartments;

— heat release/smoke density requirements for aeroplanes with reduced seating capacity;

— large glass items and displays;

— emergency exit signs on aeroplanes with a small cabin;

— floor proximity emergency escape path markings in areas away from the main aisle;

— impact on emergency lighting following transverse separation of fuselage on aeroplanes with a small cabin;

— symbolic placards;

— single 'No smoking' placards; and

— the potential benefit of expanded use of the passenger briefing cards to convey certification information.

This is the reason why the Agency has issued up to now deviations, special conditions (SCs), equivalent safety findings (ESFs) and rule interpretations through the certification review item (CRI) process, on a case-by-case basis, with the aim of better addressing executive interiors in large turbine-powered aeroplanes.

Demonstrating compliance to the applicable certification basis in such conditions creates a significant burden for the type certificate (TC) and supplemental type certificate (STC) holders, as well as for the Agency itself.

Most of the CRIs related to this subject are repetitive from one application to another. They are mostly considered mature and many of them have already undergone a public consultation process through the comment-response tool (CRT) (when satisfying the applicable criteria). Furthermore, they are often and as much as possible aligned with the Federal Aviation Administration (FAA) policies and rules, which have been for most of the CRIs incorporated in the Special Federal Aviation Regulation (SFAR) No 109 in May 2009; a SFAR has no equivalent in the EU regulatory framework.

Using CRIs because of the absence of adequate specifications or acceptable means of compliance is a source of time-consuming discussions, and prevents full transparency of the certification process, while raising doubts regarding the provision of a level playing field.

Although a large consensus was reached within the SLRG for most of the proposed amendments, some discussions on a limited number of issues to be addressed were not conclusive. The SLRG delivered to the Agency a draft NPA which included four dissenting views to be arbitrated. These different opinions are presented in the Appendix, together with the final decision of the Agency.

4.1.1. Safety risk assessment

The purpose of the proposed amendments is not to address a new safety threat. No catastrophic accident is anticipated in the future, should these proposed amendments not be implemented.

Whereas the main potential benefit is time reduction and cost savings for all stakeholders, while reinforcing the level playing field, the amended and new requirements, as well as the clarifications provided on the interpretations of the rules, are believed to ensure an acceptable level of safety in all areas, if not having a positive impact on safety. In a few cases, (uniformity of emergency exits distribution as per amended CS 25.807(e), lavatory fire protection as per amended CS 25.854)), a safety benefit is expected by further clarifying the intent of the original rule and avoiding interpretations that would lower the safety standard.

The proposed changes are based on the experience from certification projects, for which no negative safety records could be found, and are meant to provide harmonisation with a partially equivalent FAA set of rules (SFAR No 109).

4.1.2. Who is affected?

— Large aeroplane manufacturers;

— cabin equipment suppliers;

— large aeroplane operators;

— modifiers of large aeroplanes; and

— the Agency.

4.1.3. How could the issue/problem evolve?

Without resolution, and with the rapid development of an increasing demand for unique and complex executive interiors (refer for instance to the '**Bombardier Business Aircraft Market Forecast 2015-2024**'), there is an increased risk over time to have a CS that is inadequate for some types of products that should be compliant thereto.

If CS-25 is not amended as proposed, there will be a continuous increase in cost and time of the certification process for large aeroplanes fitted with executive interiors. The Agency and the applicants would have to administer additional CRIs that would continue to divert all stakeholder's resources from more critical issues.

4.2. Objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2 of this NPA.

The specific objectives of this proposal are:

— to clarify CS-25 requirements and interpretations thereof, based on experience feedback from certification projects, whilst reducing costs and administrative burden on applicants and the Agency when certifying executive interiors (avoid repetitive issuance of CRIs); and

— to provide alternative criteria to the ones included in the current CS-25 for certifying executive interiors in large aeroplanes, which will take into account the specificities of low-occupancy aeroplanes' interiors and the intended type of operations of such aeroplanes; the ultimate goal is to maintain a high and uniform level of safety while facilitating the development and certification of executive interiors.

In addition, both objectives are intended to ensure a level playing field among type certificate (TC) and supplemental type certificate (STC) holders, by harmonising the rules (between the FAA and EASA) and the interpretations thereof.

4.3. Policy options

Five options have been considered, as indicated in Table 3 below:

Table 3: Selected policy options

Option No	*Short title*	**Description**
0	Do nothing	Baseline option: no change in rules.
1	Adopt SFAR	Adopt SFAR No. 109 as it is, without any other change.
2	Amend CS-25 — Book 2 only	Amend only interpretations of CS-25 by updating existing AMCs and introducing new ones.

3	Amend CS-25	Amend the requirements of CS-25 and associated AMCs, and introduce new requirements and AMCs in CS-25
4	Create new CS	Create a specific CS dedicated to the certification of executive interiors, with associated AMCs.

4.4. Analysis of impacts

4.4.1. Safety impact

All five options are considered to be more or less neutral in terms of a safety impact.

Options 1, 2, 3 and 4 are not specifically targeted to improve safety. They provide in some areas alleviations to requirements based on compensating and mitigating factors, which aim at ensuring an acceptable level of safety, whereas on some other areas, it is believed that safety could be slightly improved by providing access to clearer requirements and/or interpretations to all stakeholders.

4.4.2. Environmental impact

All five options are neutral from the environmental perspective.

4.4.3. Social impact

All five options are neutral from the social perspective.

4.4.4. Economic impact

When assessing the economic impact of the five options, the following considerations were taken into account:

— Addressing the stated issue enables to reduce the costs associated with the administrative burden of certifying designs using a not fully appropriate set of requirements. No economic impact assessment was carried out for this NPA, but the regulatory evaluation prepared for the 'Notice of Proposed Rulemaking (NPRM)'No FAA-07-13'[5] (which introduced SFAR No. 109) in 2009 indicated that a typical certification under this SFAR might save the aeroplanes purchasers four months and USD 725 000 per exemption, compared to existing certification procedures. The completion centres would accrue savings of approximately USD 100 000 per aeroplane per exemption, and the FAA would accrue savings of approximately USD 6 000 per aeroplane per exemption. This results in approximately USD 725 000 plus USD 100 000 plus USD 6 000 in savings, for a total of USD 831 000 per aeroplane per exemption.

— Addressing the stated issue enables to set the applicable certification requirements to a more appropriate certification standard with respect to the specificities of the non-commercially operated aeroplanes, or aeroplanes fitted with executive interiors; based on stakeholder's inputs, this is expected to have a positive impact on the global economy of the Business Aviation (BA) market, by lowering the certification costs and promoting the development of the upper segment of the low-occupancy aeroplanes market (ACJs and BBJs).

[5] http://www.federalregister.com/Browse/AuxData/C0F3D8E5-DFC7-47DA-8CBE-50E06AE6E4B0

Based on the anticipated evolution of the market of business aeroplanes and executive interiors and its effect on the issue at stake (please refer to Chapter 4.1.3 above), Option 0 is considered to have a potential negative economic impact as the current burden to develop CRIs will continue and even intensify since the number of aeroplane models requiring such CRIs will increase.

Options 1 and 2, by partially addressing the issue, would have a moderate positive economic impact.

Option 4 would on the one hand entirely address the issue, but it would at the same time increase the burden on the Agency regarding regulatory activitys, both for drafting new CSs (one-time additional burden), and for maintaining them (evolutions, consistency with CS-25, etc.).

Option 3 is believed to be the only one able to entirely address the issue without any other adverse effect, and would, therefore, have a greater positive economic impact.

4.4.5. Proportionality issues

All five options are neutral from the proportionality perspective.

4.4.6. Impact on regulatory coordination and harmonisation

SFAR No 109 'Special Requirements for Private Use Transport Category Aeroplanes' has been issued in May 2009 by the FAA, and partially addresses the stated issue. For the purpose of evaluating the impact on regulatory harmonisation, the projected results of Options 0 to 4 are compared with the current relevant FAA requirements as a whole, established by the FAR Part 25 and the SFAR No. 109.

Option 0 is considered as the option ensuring the lowest level of harmonisation with the FAA, whereas Option 1 ensures by definition the highest level of harmonisation with the FAA.

Option 2 would only result in harmonisation of certain interpretations of the current requirements and certain AMCs. But by introducing no new requirement nor amending the existing ones, the level of harmonisation achieved would be very limited.

Options 3 and 4 aim at introducing a set of amendments and new rules, some of them copying, or at least being inspired by, the existing SFAR No. 109. In areas not covered by SFAR No. 109, the final decision would be expected to serve as a basis for future harmonisation works with the FAA.

However, Option 4 is not expected to be adopted by other authorities because of its adverse economic effect (see Chapter 4.4.4 above).

Although Option 3 possibly creates new standard differences between CS-25 and the equivalent foreign authorities' specifications for large transport aeroplanes, overall, this option sets the highest level of harmonisation, considering the full regulatory framework (special requirements, special conditions, etc.).

4.5. Comparison and conclusion

4.5.1. Comparison of options

Option 0 (do nothing) is considered to be neutral in all aspects, but possibly negative from the economic perspective: the specific objectives set out in Chapter 4.2 above would not be met, resulting in maintaining the current situation as it is, with excessive costs and administrative burden for both the Agency and industry, while the pressure from the market could magnify the issue in the years to come.

Option 1 would consist of simply adopting SFAR No 109, since it is an already existing published Regulation addressing the same kind of issues. This would offer the highest degree of immediate harmonisation. However, SFAR No 109 does not cover the entirety of the identified issues, and its scope is limited to non-commercial operations. Besides, since the EU and US regulatory frameworks are different, the practicality of such an option is put into question, and in any case, it is the FAA's stated intention to consider further development of the SFAR No 109, based on the outcome of this NPA.

Option 2 would only partially achieve the specific objective, without even providing full harmonisation of the FAA and EU regulations.

Options 0, 1 and 2 have been discarded as not entirely addressing the issues identified and, therefore, not meeting the specific objective.

Option 3 would enable to entirely meet the specific objective by addressing the whole spectrum of issues. The economic impact would be significantly positive; regulations would be better but not fully harmonised.

Option 4 would achieve the same result as Option 3 with the additional possibility of autonomous future enhancements. However, the need for continuous consistency with CS-25 in case of future evolutions would create an additional constraint in regulatory activities.

Therefore, Option 3 (amend CS-25, Book 1 and CS-25, Book 2) is the preferred one.

4.5.2. Monitoring and ex post evaluation

In order to ensure that the specific objective of reducing certification costs has been met, the Agency intends to monitor the average working hours spent (by the Agency) and the number of CRIs issued on executive interior certification projects.

4.5.3. Open question to stakeholders

Additionally, stakeholders are kindly invited to provide data on administrative cost impacts introduced by these draft rules and any other quantitative information they may find necessary to bring to the attention of the Agency.

As a result, the relevant parts of the RIA might be adjusted on a case-by-case basis.

5. References

5.1. Affected regulations

N/A

5.2. Affected CS, AMC and GM

Decision No. 2003/2/RM of the Executive Director of the Agency of 17 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for large aeroplanes ('CS-25')

5.3. Reference documents

— Federal Aviation Administration (FAA) Notice of Proposed Rulemaking (NPRM) No. 07-13, 'Special Requirements for Private Use Transport Category Airplanes' (72 FR 38732), 13 July 2007.

— Special Federal Aviation Regulation (SFAR) No. 109 'Special Requirements for Private Use Transport Category Airplanes', Docket No. FAA-2007-28250, 8 May 2009.

6. Appendix — Supplement to the Explanatory Note: Detailed explanation of the dissenting views and arbitration by the Agency

6.1. Introduction

The proposed amendments have been drafted by a stakeholder-led rulemaking group (SLRG) in accordance with the applicable procedures.

In spite of common efforts to reach a consensus on all proposed changes, the external task leader identified dissenting views between the group members, which were submitted to the Agency for arbitration; the final decision on the NPA publication was left to the Agency.

The dissenting views are detailed in this Appendix:

— dissenting views on the new proposed Appendix S, Paragraph S25.20(b)(2); and

— dissenting views on the applicability of the new proposed Appendix S Paragraphs S25.10(e), S25.20(a)(2), and S25.30(a).

6.2. Dissenting views on the new proposed Appendix S, S25.20(b)(2)

Although the members of the SLRG shared a common view on the criteria to assess obstructions to emergency exits (i.e. minor obstructions, major obstructions and major obstructions but with compensating features either to assure their removal when critical or to maintain an equivalent evacuation time), diverging positions emerged regarding the criteria for accepting designs with major obstructions based on equivalent evacuation time considerations.

It was agreed, however, that any such allowance for major obstructions would only be considered for aeroplanes with a maximum operational passenger seating configuration of 19 or less.

Some group members considered that the case of a deployable item not safely stowed prior to landing is an abnormal situation, for which a degraded evacuation configuration should be acceptable: a removable obstruction, duly placarded to be stowed for taxiing, take-off and landing, would be removed in case of evacuation, and would thus no longer constitute an obstruction. The evacuation, in the improbable case that the obstruction remains (either because the occupants failed to stow the obstacle prior to the emergency situation or because the obstacle inadvertently deployed during evacuation), should not be required to be as quick as with the evacuation configuration without the minor obstruction for an aeroplane having a maximum of 19 passengers seats. This was the case because such an aeroplane is not subject to any quantified evacuation time requirements and has in any case an intrinsically good evacuation time performance.

Therefore, they considered that an acceptable level of safety with a partially obstructed emergency exit could be demonstrated by setting an absolute 45-sec evacuation time with the deployed obstruction (i.e. half of the 90-sec maximum required by CS 25.803(c) for aeroplanes with a passenger seating configuration greater than 44).

Some other group members, on the contrary, considered that the evacuation should be shown to be as quick as in the case there is no obstruction: the allowance for a major obstruction should be fully compensated by a requirement to maintain the same time for evacuation of all the aeroplane's occupants. They believed that this would be the only way to demonstrate an equivalence in safety.

They hence proposed a comparative assessment of the obstructed and non-obstructed emergency exit performance by using the normal Latin-square test method, most likely leading to a reduction of the number of cabin occupants as a compensating factor, in order to maintain the same evacuation time as the one demonstrated without obstruction: if the evacuation time is higher with the major obstruction in place, then the number of occupants should be reduced in order to maintain the evacuation time.

When arbitrating this dissenting view, and deciding to support the second approach, the Agency considered the following arguments:

— the FAA issued in 2008 a Policy Memorandum (ANM-115-08-02) and the Agency issued in 2011 a Certification Memorandum (CM-CS-002) on the access to and opening of Type III and IV exits, which both clarify that deployable items must be in the most adverse positions when assessing compliance with the applicable requirements;

— many aeroplanes with a passenger seating capacity of 19 or less are designed with only one exit on each side of the fuselage (main-entry door/opposite overwing exit); in such a case, the obstructed exit will be the only available emergency exit on one side of the aeroplane, making this issue particularly critical;

— the possibility that the size and usability of such an exit may be reduced below those of a Type III exit should be compensated for in a manner consistent with the principles of determining the maximum number of passenger seats (please refer to CS 25.807(g)), which means by an appropriate reduction in the passenger capacity; and

— the Latin-square method was found to be the appropriate method to identify and quantify any appreciable reduction in exit usability, whereas the simple '45 seconds' criteria cannot provide a full indication of the impact of the exit obstruction on the evacuation of the aeroplane.

6.3. Dissenting views on the new proposed Appendix S, S25.10(e), S25.20(a)(2), and S25.30(a)

The dissenting views on these three proposed amendments to CS-25 have been grouped together since all three relate only to disagreement regarding the extension of the applicability of the concerned requirements to commercially operated (low-occupancy) aeroplanes and not the content of the requirements themselves.

Aeroplanes with a passenger seating capacity of 19 or less already benefit from some alleviations of the requirements that apply to the large transport category aeroplanes as regards the issues associated with two of the three proposed amendments for which agreement could not be reached: specifically, requirements concerning the width of aisle (CS 25.815) and flammability properties of cabin materials (i.e. heat release/smoke density requirements of CS 25.853). The proposed new Appendix S to CS-25 extends some of these alleviations to non-commercially operated aeroplanes with passenger seating configurations of more than 19, as defined by the new Paragraph S25.1(a), in line with previously granted deviations from CS-25 that have been found appropriate for such non-commercially operated aeroplanes because the familiarity passengers develop with their cabin environment is seen as a sufficient compensating factor.

However, these alleviations have never been authorised for commercial operations. As a result, the luxurious interiors of large airliners designed for commercial operations are often and deliberately proposed with no more than 19 seats that can be occupied during take-off and landing, in order to

avoid having to comply with the more demanding requirements. Convertible aeroplanes designed for dual use (commercial or non-commercial operations) are also typical: the only economically viable solution to install 'VIP materials' on such aeroplanes (e.g. varnished woods that do not meet the heat release/smoke density requirements of CS 25.853) is to limit them to 19 seats that can be occupied during take-off and landing, when commercially operated, whereas more seats can be made available when non-commercially operated. There is, therefore, a strong industry interest in applying the same rule for the same aeroplane design, regardless of the type of operations.

Concerning these three points of disagreement, the Agency based its decision on the specific arguments presented for each (please see below) as well as on the following considerations that apply for all three:

— It is agreed that aeroplanes of the upper segment of the 'low-occupancy aeroplanes' feature cabin interiors that overall offer very positive evacuation capabilities, which would contribute to maintaining an acceptable level of safety. However, the extension of already granted deviations (that were only ever issued for non-commercially operated aeroplanes) to commercially operated aeroplanes should be backed up by research data.

— The 'low-occupancy aeroplane' definition, which is solely based on design considerations and not on types of operation, is unable to exclude all real airliners used for scheduled commercial operations; in the past years, some large transport aeroplanes (mostly single-aisle) have been refurbished in full business class configuration; a survey made in 2015 identified at least five aeroplanes of this type in operation which would fall into the 'low-occupancy aeroplanes' category: 2 AIRBUS 318 fitted with 32 seats (23.5 % of the 136 maximum passenger seating capacity), 2 AIRBUS 319 ACJ fitted with 40 seats (27.5 % of the 145 maximum passenger seating capacity) and 1 BOEING 757-200 fitted with 74 seats (30.9% of the 239 maximum passenger seating capacity).

6.3.1. In-flight obstructions of aisles (S25.30(a))

CS 25.815 specifies the width of the main aisle(s) for transport category aeroplanes. Although the rule itself does not exempt compliance for any flight phase(s), both the FAA and the Agency have previously accepted for specific applications that the required aisle width may be lowered during in-flight use, not during taxiing, take-off and landing, and only in the case of aeroplanes that are either limited to non-commercial operations (in line with a respective allowance included in FAA SFAR No. 109), or have no more than 19 passenger seats if intended for commercial operations (in line with a comparable allowance for Part 135 operations only, as stated in FAA Policy Statement PS-ANM-25.815-01).

The extension of such an allowance to large airliners configured for low occupancy, and with more than 19 passenger seats, has been thoroughly reviewed, but the discussions ended in the following diverging points of view.

Some group members considered that an acceptable level of safety could be maintained for such aeroplanes, based on the following stated principles:

— as long as an aisle remains practicable and maintains the capability of rapid movement within the cabin in the case of an in-flight emergency situation, the safety objective of maintaining an aisle during flight will be met;

— the performance criteria proposed to assess an aisle's usability in its most adverse configuration should be based on consideration of the physical cabin configuration, irrespective if the aeroplane is operated commercially or not;

— large airliners configured for low occupancy typically offer more space around the desired in-flight obstacles, thus increasing the possibilities to easily negotiate the typical obstacles envisaged (seat leg rests, armrests, backrests, video arms);

— the probability of excessive aisle obstructions caused by passengers inappropriately moving items into the aisle (e.g. swivelling seats, folding tables etc.) remains very low because there is a limited number of passengers compared to full-occupancy aeroplanes; and

— credit can also be taken for the presence of cabin crew members on board as required by the operational regulations for a capacity over 19 passengers, whose role with respect to aisles is to ensure that they are kept free when an item protruding into an aisle is no longer used.

These group members presented examples of aisle arrangements and the related excessive consequences for passenger amenities, even for large airliners configured for low occupancy, if subject to a requirement to maintain the necessary aisle width at all times.

These group members finally considered that their proposed extension to commercial operations of the allowance to use aisle space in flight would be consistent with the newly created notion of 'low occupancy', namely that this could be seen as a substitute for the existing '19-passenger limit', considering that the category of operations of an aeroplane is not the proper discriminant parameter to be used as it has no physical sense with respect to the practicability of using an aisle.

Some other group members did not agree that an acceptable level of safety would be maintained by following the above proposal, and proposed an alternative, though maintaining some of the desired elements, with the following rationales:

— aisle encroachment on any non-commercially operated aeroplanes has been previously discussed and agreed in the frame of the SFAR No. 109 development;

— justification for an extension to commercial operations for the smaller 19-passenger aeroplanes is agreed on the basis of need, i.e. the space is limited in such aeroplanes; larger aeroplanes, limited to the carriage of 19 passengers can also be justified on the basis, as discussed above, that the type of operation is not of prime consideration for the safety issue;

— however, an extension to all 'low-occupancy aeroplanes' is not justified and would not be harmonised with the FAA Policy Statement PS-ANM-25.815-01 (17 December 2012), that allows encroachment in flight for non-Part 121 operated aeroplanes with a passenger seating capacity of 19 or less, provided that 'all areas of the cabin remain easily accessible'; and

— the size of the cabin and the larger passenger capacity of a large aeroplane (larger than a 19-seat) increases the risk and the magnitude of aisle obstruction during an in-flight emergency, which is the reason why an acceptable level of safety is difficult to be achieved.

The Agency decided to support this latter, more conservative approach.

6.3.2. Interior materials flammability requirements (S25.20(a)(2))

Customers of business aeroplanes typically request use of materials (e.g. varnished woods) in the design of the cabin interior that cannot meet the heat release and smoke emission characteristics in accordance with the test requirements of CS-25, Appendix F, Parts IV and V. However, CS 25.853(d) requires interior components of aeroplanes with passenger capacities of 20 or more to meet the aforementioned test requirements.

As a result, for large aeroplanes that have a maximum passenger seating capacity of 20 or more, in order to be able to use these materials in the cabin interior:

— when operations are limited to non-commercial, deviations (or exemptions, respectively) are requested, and usually accepted by the Agency (or the FAA, respectively), provided that the cabin is shown to be capable of being evacuated in 45 seconds, in lieu of 90 seconds as required by CS 25.803(c); in the context of non-commercial operations, the quicker evacuation performance standard has been accepted as a sufficient mitigating factor for the failure to comply with normal flammability standards;

— when operations are not limited to non-commercial, the maximum operational passenger seating configuration is limited to 19.

The intent of the new proposed requirement S25.20(a)(2) is to introduce in CS-25 what has been previously accepted by means of the above-mentioned deviations. It is, therefore, limited to non-commercially operated aeroplanes.

The extension of its applicability to the large aeroplanes configured for low occupancy, but with a maximum operational passenger seating configuration not limited to 19 irrespective of the type of operations (commercial/non-commercial), has been extensively discussed in the group. In particular, a proposition to set a more stringent requirement for the evacuation time, namely to improve by one minute the evacuation time required by CS 25.803(c) (i.e. an evacuation time of 30 seconds maximum in lieu of 90 seconds) has been reviewed, but a consensus could not be reached.

Some group members considered that the requirement to demonstrate that the aeroplane's occupants can be evacuated within 30 seconds was appropriately compensating for the non-compliance with CS 25.853(d), and would therefore provide an equivalence in safety. The 30-seconds criterion originates from the conclusion of the FAA review of the full-scale fire test data used to establish the requirements for interior materials in the frame of Exemption 6820 granted to Boeing in 1999: a '*one minute improvement in evacuation time correlates with the benefits derived from the improved materials for the post-crash scenario*'. As mentioned by the FAA in Exemption 6820: '*in promulgating the rulemaking* [CS-25, Appendix F, Part IV and V]*, the FAA did incorporate a discriminant based on passenger capacity* [19 maximum], *that was intended to address smaller airplanes, where the ratio of exits to passengers is typically quite good, and where the evacuation times are expected to be quite low. Under these conditions, the benefits of improved materials were expected to be negligible. The airplane type discussed in the petition was not envisioned by the rulemaking, insofar as the large size with low passenger count is concerned. The FAA has considered the issue of the evacuation capability of the airplane relative to the flammability of the materials and believes that there may be some relief possible*'.

The group members argued that the 30-seconds (or one-minute improvement) evacuation time criterion was first proposed by the FAA in Exemption 6820 irrespective of the type of operations (commercial/non-commercial) before this position was revised in Exemption 6820A, which introduced a less stringent criteria of 45 seconds for the evacuation time together with the limitation to non-commercial operations. The justification included additional parameters such as the public interest and the passenger familiarity to the compartment interiors.

The group members, therefore, proposed for low occupancy aeroplanes irrespective of the type of operations (commercial/non-commercial), to revert to the initial more stringent requirement set out in the earlier Exemption 6820 as a compensation for the request to allow commercial operations (the aeroplane must be capable of being evacuated in 30 seconds maximum under the conditions of CS-25, Appendix J), considering that this would constitute an alternative to interior components that meet the test requirements of CS-25, Appendix F, Part IV and V, while meeting the safety objective of the requirement of CS 25.853(d).

Some other group members did not adhere to this reasoning. They argued that although the relevant heat release and smoke emission requirements are intended to ensure that the flashover occurs late enough for the evacuation to take place, the correlation between certification evacuation test methodology times (CS-25, Appendix J) and actual flashover times is very indistinct. Evacuation times measured in accordance with CS-25, Appendix J conditions are not believed to capture the true complexity of the real post-crash scenarios and thus, are not acceptably reliable data to be used as compensation for compliance with reduced flammability requirements in the context of commercial operations.

In the case of non-commercially operated aeroplanes, it has long been agreed that an acceptable level of safety might be achieved by means that are not fully and strictly equivalent to the standards set by CS-25. For instance, the consideration of passenger familiarity with the cabin features and layout may allow an acceptable level of safety to be achieved. Conversely, in the case of commercial operations, it was considered that closer adherence to equivalence in safety was required.

For many years now, deviations from this requirement (but not ESFs) have been issued by the Agency, provided that the aeroplane is not commercially operated, and evacuation is demonstrated to be possible in less than 45 seconds; this is in line with the FAA exemptions, and the same approach, which was later incorporated in FAA SFAR No. 109. Both the Agency and the FAA agreed that the compensating factors in these deviations/exemptions do not fully compensate for the safety reduction caused by non-compliant materials, whereas a fully equivalent safety level is sought for commercially operated aeroplanes.

The Agency decided to support this latter, more conservative approach.

6.3.3. Deactivation of emergency exits creating a distance of more than 60 ft between exits (S25.10(e))

CS 25.807(f)(4) requires that no emergency exit be farther than 18.3 m (60 ft) from any adjacent emergency exit. In some cabin interior designs for business aeroplanes, emergency exits are disabled to allow greater flexibility in interior arrangements, leading to non-compliance with this rule. For many years, the Agency has accepted requests for deviation from this requirement, under the condition that the aeroplane is limited to non-commercial operations.

Some group members considered that although there are no existing aeroplanes operating commercially with a maximum operational passenger seating configuration of 20 or more, and featuring a distance between exits greater than 60 ft, the new criterion proposed to govern the seat-to-exit distance (the '30/45 ft rule', as referred to in CS 25.807(e)(2)) would offer new opportunities for customised interiors of low-occupancy aeroplanes with a maximum passenger seating capacity of 20 or more, while maintaining an acceptable level of safety even for commercial transportation.

They argued that the '60 ft rule' of CS 25.807(f)(4) was introduced in order to uniformly distribute emergency exits on aeroplanes, considering the typical interiors for commercial transportation (airliners) and, therefore, assuming a uniform distribution of passengers in the cabin. For large aeroplanes that have been initially designed for the purpose of commercial transportation (airliners), and whose cabin is to be later refurbished with an executive interior, the introduction of some areas designed for a low number of occupants (typically offices, bedrooms, lounges, etc.) and some other areas designed for a higher density of occupants (staff seating) would often result in situations where the passengers are no longer distributed uniformly in the cabin. This is why they considered that the newly defined seat-to-exit distance rule (the '30/45 ft rule' as referred to in CS 25.807(e)(2)), which intends to achieve an acceptable distribution of passengers in an interior with non-uniformly distributed exits (in the case where some of the initial emergency exits have been deactivated), would be sufficient on its own to meet the intent of the requirement of CS 25.807(f)(4).

Finally, the group members argued that keeping different requirements depending on the type of operations (commercial/non-commercial) would result in impractical maintenance actions for the so-called dual-use aeroplanes (those aeroplanes that can be commercially and non-commercially operated). Aeroplanes operating non-commercially with deactivated exits would be required to reactivate such exits for commercial operations (the reactivation effort would be excessive as it would likely go beyond standard maintenance actions: interior furnishing modifications, emergency lighting and markings modifications, interior and exterior markings modifications, etc.).

Some other group members considered that the '60 ft rule' of the CS 25.807(f)(4) requirement was introduced as a pragmatic way to prevent an unchecked increase in exit-to-exit distance. No alleviation to this rule has ever been accepted for commercial operations, and it was believed that this should not change. This is because, as commonly accepted, the adverse safety effect of increased distances from seats to exits is not sufficiently compensated for by a reduction in seating capacity (as indicated in the notice of proposed rulemaking (NPRM) No FAA-07-13, which introduced FAA SFAR No. 109). The increased distances from seats to exits is considered to be incompatible with passengers being possibly unfamiliar with the aeroplane cabin layout.

The Agency decided to support this latter, more conservative approach.