



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

# Advisory Circular

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**Subject:** Transport Airplane Cabin Interiors  
Crashworthiness Handbook

**Date:** XX/XX/XXXX  
**Initiated By:** AIR-600

**AC No:** 25-17A  
**Change:** 2

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1. **PURPOSE.** Change 2 provides guidance for several new or amended cabin interiors regulations adopted by amendment 25-XXX. That amendment enables private use and low occupancy cabin interior arrangements, adds a definition of low occupancy, addresses passenger seat size and spacing, allows carriage of persons authorized by § 121.583 on cargo airplanes, and allows installation of medical stretchers with relief from the dynamic emergency landing conditions. In addition, Change 2 also provides guidance for other cabin interiors regulations adopted by amendments 25-114, 25-116, 25-123, 25-128, and 25-142. Regulatory text is available digitally in many places on the internet. In many cases the regulatory text is not included in an effort to minimize the changed pages of this document. In these cases, a link to the specific regulation section and amendment level is provided to the FAA’s online [Dynamic Regulatory System \(DRS\)](#).
2. **PRINCIPAL CHANGES.** Change 2 incorporates the following changes:
  - a. Adds paragraph 6. Reference to new § 25.4(d), “Definitions,” for definition of terms for non-commercially operated and low occupancy. Refers to EASA AMC to appendix S, S25.1 as an acceptable means of compliance with the rule.
  - b. Adds paragraph 67. Reference to amendment 25-114 to § 25.783, “Fuselage doors.” Refers to AC 25.783-1A, “Fuselage Doors and Hatches,” dated April 25, 2005, for an acceptable means of compliance.
  - c. Adds paragraph 89. Reference to amendment 25-XXX to § 25.785, “Seats, berths, safety belts, and harnesses,” which excepts carriage of medical patients on stretchers from the requirements of § 25.562.
  - d. Adds paragraph 111 and 112. Reference to new § 25.788, “Passenger amenities,” for installation of showers, large display panels, and large nonstructural glass panels in airplane cabins. Refers to EASA AMC 25.788(a) and AMC 25.1447(c)(3) as acceptable means of compliance with § 25.788(a) for showers. Refers to EASA AMC 25.788(b) as an acceptable means of compliance with § 25.788(b) for large display panels. Refers to EASA AMC No 2 to CS 25.603(a) Suitability and durability of materials — Large glass items as an acceptable means

of compliance with § 25.788(c), except that the strength test is passed if no glass particles are expelled at any distance.

e. Adds paragraph 144. Reference to amendment 25-153 to § 25.791 “Passenger information signs and placards” to allow lighted NO SMOKING signs the option to be either illuminated continuously or manually operable.

f. Adds paragraph 241 and 242. Reference to new § 25.797, “Requirements for carriage of authorized persons on all-cargo airplanes with Class E cargo compartments” for carriage of persons authorized by § 121.583 in cargo airplanes.

g. Adds paragraph 253. Reference to amendment 25-XXX to § 25.801, “Ditching,” which corrects a reference to § 25.807(i).

h. Updates paragraphs 356, 357, 358, and 359. Reference to amendments 25-32, 25-34, 25-46, 25-47, and 25-72 to § 25.809, “Emergency exit arrangement.”

i. Adds paragraphs 360, 361 and 362. Reference to amendments 25-114, 25-116, and 25-XXX to § 25.809, “Emergency exit arrangement.” Refers to EASA AMC 25.809(a) and AMC 25.809(a)(3) as an acceptable means of compliance with § 25.809, amendment 25-XXX.

j. Updates paragraphs 372, 373, 374 and 375. Reference to amendments 25-72, 25-88, 25-114 and 25-XXX to § 25.810, “Emergency exit assist means and escape routes.” Refers to EASA AMC 25.810 for an acceptable method of compliance with § 25.810(a).

k. Adds paragraph 388. Reference to amendment 25-XXX to § 25.811, “Emergency exit marking.” Refers to EASA AMC 25.811(e)(4) as an acceptable means of compliance with § 25.811(e).

l. Adds paragraphs 398, 399 and 400. Reference to amendments 25-116, 25-128, and 25-XXX to § 25.812, “Emergency lighting.” Refers to EASA AMC 25.812(b)(1), AMC 25.812(b)(2), AMC 25.812(e)(2), and AMC 25.812(l)(1) as acceptable means of compliance with § 25.812(b), (e)(2), and (l)(1).

m. Adds paragraphs 420, 421 and 422. Reference to amendments 25-116, 25-128, and 25-XXX to § 25.813, “Emergency exit access.” For amendment 25-XXX, refers to EASA AMC 25.813, AMC 25.813(c), and AMC 25.813(e) as acceptable means of compliance.

n. Adds paragraphs 501 and 502. Reference to new § 25.821, “General cabin arrangement.” Refers to EASA AMC to appendix S, S25.10(a), S25.10(b), S25.10(c), and S25.10(d) and (e) as an acceptable means of compliance.

o. Adds paragraphs 511 and 512. Reference to new § 25.823, “Emergency evacuation and flammability.” Refers to EASA AMC to appendix S, S25.20(a)(1), S25.20(b), and S25.20(b)(1) as an acceptable means of compliance.

p. Adds paragraphs 521 and 522. Reference to new § 25.825, “*Movement inside cabin during flight.*” Refers to EASA AMC to appendix S, S25.30(a) and S25.30(b) as an acceptable means of compliance.

q. Adds paragraphs 531 and 532. Reference to new § 25.827, “*Markings and placards.*” Refers to EASA AMC to appendix S, S25.40(b) and S25.40(c) as an acceptable means of compliance.

r. Adds paragraphs 541 and 542. Reference to new § 25.829, “*Cabin crew direct view.*” Refers to EASA AMC to appendix S, S25.50(b) as an acceptable means of compliance.

s. Adds paragraphs 551 and 552. Reference to new § 25.830, “*Security Considerations for Non-Commercially Operated Airplanes.*”

t. Adds paragraphs 633 and 635. Reference to amendments 25-116 and 25-XXX to § 25.853, “*Compartment interiors.*”

u. Adds paragraph 643. Reference to new amendment to § 25.854, “*Lavatory fire protection.*” Refers to EASA AMC 25.854 as an acceptable means of compliance.

v. Adds paragraphs 675 and 676. Reference to amendments 25-142 and 25-XXX to § 25.857, “*Cargo compartment classification.*” For amendment 25-142, refers to AC 25.857-1, “*Class B and F Cargo Compartments,*” dated February 3, 2016, for an acceptable means of compliance.

w. Adds paragraphs 792 and 793. Reference to amendments 25-123 and 25-XXX to § 25.1365, “*Electrical appliances, motors, and transformers.*” For amendment 25-123, refers to AC 25.1365-1, “*Electrical Appliances, Motors, and Transformers,*” dated November 27, 2007, for an acceptable means of compliance. For amendment 25-XXX, refers to EASA AMC 25.1365(b) as acceptable means of compliance.

x. Adds paragraph 974 and 976. Reference to amendments 25-116 and 25-XXX to § 25.1447, “*Equipment standards for oxygen dispensing units.*” For amendment 25-116, refers to EASA AMC 25.1447(c)(4) as an acceptable method of compliance. For amendment 25-XXX, refers to EASA CS-25 Book 2, AMC 25.1447(c)(3) as an acceptable method of compliance.

y. Adds paragraphs 1111 and 1112. Reference to new § 25.1583(j), “*Limitation for non-commercially operated airplanes.*” to include limitations in the limitations section of the airplane flight manual for proposed airplane designs that would incorporate interior features that are permitted only in non-commercially operated airplanes.

z. Updates references to ACs in appendix 3.

ab. Updates amendment history in appendix 7.

ac. Adds new appendix 16 with references to policies issued after the last AC revision.

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**Federal Aviation  
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# Advisory Circular

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**Subject:** Transport Airplane Cabin Interiors  
Crashworthiness Handbook

**Date:** 05/24/16

**AC No:** 25-17A

**Initiated By:** ANM-115

**Change:** 1

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1. **PURPOSE.** This change clarifies guidance for the head strike zone, to standardize application of the head strike zone when showing compliance with Title 14, Code of Federal Regulations (14 CFR) 25.785(b) and (d). Protecting the occupant's head from serious injury requires determination of the zone that the head could strike, i.e., the head strike zone. Because inertial forces will cause the head to travel along the longitudinal axis of the airplane, when applicants show compliance for the inertia forces specified in §§ 25.561 and 25.562, the head strike zone should be oriented in the same direction (the airplane longitudinal axis) as the forces are applied. The guidance in the previous release of this AC did not state this to be the case, so some applicants misinterpreted the head strike direction to be aligned with the seat, regardless of angle of installation of the seat and the inertial forces. This interpretation was not consistent with § 25.785, which protects occupants in the emergency landing conditions specified in §§ 25.561 and 25.562. Additionally, a literal interpretation of the head strike zone depicted in AC 25-17A would include portions of the occupant's own seat very close to the seat back and seat bottom cushions. This part of the zone is not considered likely to cause serious injury to the occupant's head and has been removed from the zone.

2. **PRINCIPAL CHANGES.** Change 1 updates AC 25-17A, *Transport Airplane Cabin Interiors Crashworthiness Handbook*, dated May 18, 2009. We have added the change number and date of revision at the top of each changed page. We have also marked the changes with a vertical change bar in the margin. Specifically, Change 1 incorporates the following changes:

a. On pages 46, 59, 72, 85, 98, 112, 126, and 140, the definition of the head strike zone is modified to specify the zone is in the direction of the airplane longitudinal axis, and does not include those portions of the occupant's own seat that are very close to the seat back and seat bottom cushions.

b. On pages 47, 60, 73, 86, 99, 113, 127 and 141, the figure showing the head strike zone is modified to show the zone is in the direction of the airplane longitudinal axis, and does not include those portions of the occupant's own seat that are very close to the seat back and seat bottom cushions.

**Page Control Chart**

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/s/ Michael Kaszycki

Michael Kaszycki  
Acting Manager, Transport Airplane Directorate  
Aircraft Certification Service



U.S. Department  
of Transportation  
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# Advisory Circular

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**Subject: TRANSPORT AIRPLANE  
CABIN INTERIORS  
CRASHWORTHINESS HANDBOOK**

**Date: 5/18/2009**

**Initiated By: ANM-110**

**AC No: 25-17A**

**Change:**

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1. PURPOSE. This Advisory Circular (AC) provides acceptable certification methods, but not necessarily the only acceptable methods, for demonstrating compliance with the crashworthiness requirements of part 25, as amended through Amendment 25-112, of Title 14 of the Code of Federal Regulations (14 CFR) for transport category airplanes. The guidance in this AC is not mandatory nor a regulation.

2. APPLICABILITY.

a. Available guidance pertaining to part 25 is presented according to the amendment level of part 25 to which it applies. For modified airplanes certificated under part 25, the pertinent guidance may be obtained from this AC by reference to the applicable amendment level. (Compliance with later rules may be required in accordance with §§ 21.101(a) and 25.2, or with applicable operating rules as noted above.) Additional guidance may be included in this AC that pertains to either prior amendments or sections that have not been modified. This guidance has been developed to address issues that either have developed since the original issue of this AC, or were inadvertently omitted. The guidance presented in this AC for part 25 airplanes may be used for airplanes certificated under CAR 4b to the extent the rules contained in the older certification bases are the same as those of part 25. The guidance presented herein applies to part 25 through Amendment 25-112.

b. The guidance provided in this document is directed to airplane manufacturers, modifiers, foreign regulatory authorities, and FAA transport airplane type certification engineers, and their designees.

c. This material is neither mandatory nor regulatory in nature and does not constitute a regulation. It describes acceptable means, but not the only means, for demonstrating compliance with the applicable regulations. The FAA will consider other methods of demonstrating compliance that an applicant may elect to present. While these guidelines are not mandatory, they are derived from extensive FAA and industry experience in determining compliance with the relevant regulations. On the other hand, if we become aware of circumstances that convince us that following this AC would not result in compliance with the applicable regulations, we will

not be bound by the terms of this AC, and we may require additional substantiation or design changes as a basis for finding compliance.

d. This material does not change, create any additional, authorize changes in, or permit deviations from, regulatory requirements.

3. CANCELLATION. ADVISORY CIRCULAR 25-17, Transport Airplane Cabin Interiors Crashworthiness Handbook, dated July 15, 1991, is canceled.

#### 4. BACKGROUND.

a. Crashworthiness, as applied to airplane cabin interiors, denotes the incorporation in basic design of considerations pertinent to the protection of airplane occupants in a "survivable crash environment." A survivable crash environment prevails when the cabin occupants are subjected to crash forces within human tolerance levels, and the structural integrity of the passenger space remains intact such that the occupants can rapidly evacuate the airplane. Structural design for airplane safety has embodied airworthiness and crashworthiness design objectives to varying degrees. Airworthiness design objectives pertain to the ability of the airframe to withstand design loads, or to maintain safety of flight of the airplane relative to the operational environment. Crashworthiness design objectives pertain to safety of the occupants relative to the airplane. Some aspects of crashworthiness, e.g., fuel tank/system design, fuselage deformation and prevention of post-crash fires, are beyond the scope of this AC.

b. Since the inception of federal civil aircraft certification standards, prime emphasis has focused on design for airworthiness, with a preference for application of static load tests, as opposed to dynamic. The emphasis on airworthiness is understandable, since structural and handling deficiencies were inherent in early airplane designs. Further, there was not enough theoretical or technical knowledge available from service experience to generate meaningful design parameters for crash survival. Likewise, in early design, as now, dynamic criteria have been difficult to ascertain. Except for standards for seat belts, seat static load requirements, and exits, crashworthiness was given very little attention until the post-World War II period. During subsequent years, the regulatory process expanded emphasis on crashworthiness. A significant change occurred in 1967, when the Federal Aviation Administration (FAA) promulgated a series of crashworthiness standards affecting transport category airplanes. Further changes were implemented in 1972. As reflected in the rule changes of 1967, the FAA's approach to crashworthiness principally involved three areas of concern: (1) protection of airplane occupants from crash impact; (2) minimizing development and severity of potential crash fire; and (3) rapid evacuation of airplane occupants. Each of these factors has been a focal point in the periodic upgrading of regulatory standards.

c. Part 4b of the former Civil Air Regulations (CAR) was recodified in 1965 as part 25 of 14CFR. The related policy material contained in Civil Aeronautics Manual (CAM) 4b was applicable to part 25 as originally recodified and to current part 25 except in areas that have been amended since recodification. Those policies are included in this AC and listed as guidance applicable to the original recodified version of part 25.

d. This AC consists of the original part 25 of 14 CFR (1965 recodified version),

## Draft for Public Comment

followed by appropriate guidance. Amendments to the regulation are presented in chronological order, with those paragraphs changed by the amendment enclosed within [ ]. The complete regulation text is provided for each amendment. If guidance exists for an amended rule, it is presented following the regulation paragraphs. Guidance from previous amendments to the rule are reprinted for each applicable amendment of the regulation. At the end of the guidance paragraph within ( ) is the amendment level when the guidance was first applicable.

e. Certain changes may require compliance with rules later than the type certification basis. For example:

(1) § 21.101 the change product rule - helps determine when amended and supplemental type certification products need to utilize later amendment levels for areas of change.

(2) § 25.2 special retroactive requirements - requires, in part, that applicants for amended or supplemental type certification projects need to utilize amendment levels which may be later than those in the type certification basis of the airplane when the projects will result in an increase in the maximum seating capacity of the airplanes.

(3) Operating rules §§ 91.58, 121.310, 121.311, 121.312, 121.317, 121.318, 121.319, 125.113, 135.170, and Appendix A of part 135 of the CFR - require, in some cases, that airplanes operating under these parts have materials or equipment installed which are in excess of the type certification basis of the airplanes.

f. Advisory circulars listed in Appendix 3 may be revised after issuance of this AC. The latest available revision of the listed AC should be used.

/s/ Ali Bahrami

Ali Bahrami  
Manager, Transport Airplane Directorate  
Aircraft Certification Service,

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605 – 620	[RESERVED]	
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636 – 640	[RESERVED]	

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657 – 660	[RESERVED]	

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662	Amendment 25-111, Effective September 2, 2003	571
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756 – 780	[RESERVED]	

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803	Amendment 25-46, Effective December 1, 1978	601
804	Amendment 25-53, Effective August 31, 1980	603
805	Amendment 25-70, Effective November 27, 1989	606
806	Amendment 25-79, Effective September 27, 1993	608
807 – 820	[RESERVED]	

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903	Amendment 25-79, Effective September 27, 1993	629
904 – 920	[RESERVED]	
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## SECTION 25.4 DEFINITIONS

5. Section 25.4 Did Not Exist Prior to Amendment 25-152. For the requirements of this amendment, see [https://drs.faa.gov/browse/excelExternalWindow/CFR\\_20240926\\_0025\\_A\\_25-4\\_0000000.0001](https://drs.faa.gov/browse/excelExternalWindow/CFR_20240926_0025_A_25-4_0000000.0001)

6. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. (paragraph (d)).

*(d) For purposes of this part, the terms non-commercially operated and low occupancy are defined as follows:*

*(1) Non-commercially operated airplanes are airplanes that are not offered for common carriage and not operated for hire, with a passenger seating configuration limited in accordance with paragraphs (d)(1)(i) and (d)(1)(ii) of this section. The operators may receive remuneration to the extent consistent with parts 125 and 91, subpart F, of this chapter. The passenger seating configuration must not exceed:*

*(i) 19 passengers; or*

*(ii) One-half of the maximum passenger seating capacity of the type certified airplane as indicated in the airplane type certificate data sheet (TCDS), provided that:*

*(A) The total number of passengers approved for occupancy during taxiing, takeoff, or landing does not exceed 150 per deck; and*

*(B) The total number of passengers approved for occupancy on a deck during taxiing, takeoff, or landing does also not exceed one-half of the maximum passenger seating capacity for that deck as indicated in the airplane TCDS.*

*(2) A low occupancy airplane, irrespective of the type of operations (commercial or non-commercial), is an airplane that has a passenger seating configuration of:*

*(i) Not more than 19 passengers; or*

*(ii) Not more than one-third of the maximum passenger seating capacity of the type certified airplane as indicated in the airplane TCDS, provided that:*

*(A) The total number of passenger seats approved for occupancy during taxiing, takeoff, or landing does not exceed 100 per deck; and*

*(B) The total number of passenger seats approved for occupancy during taxiing, takeoff, or landing in any individual zone between pairs of emergency exits does not also 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 airplane. For the purpose of determining compliance with this zonal*

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*limitation, in the case of an airplane with deactivated emergency exits, assume that all emergency exits are functional.*

b. Guidance. Refer to EASA CS-25 Book 2, AMC to appendix S, S25.1 for guidance on the term “passenger-seating configuration.”

7 – 10. RESERVED

### SECTION 25.561 EMERGENCY LANDING CONDITIONS GENERAL

#### 11. REGULATION IN EFFECT AT ADOPTION OF PART 25.

##### a. Regulation.

*(a) The airplane, although it may be damaged in emergency landing conditions on land or water, must be designed as prescribed in this section to protect each occupant under those conditions.*

*(b) The structure must be designed to give each occupant every reasonable chance of escaping serious injury in a minor crash landing when—*

*(1) Proper use is made of seats, belts, and all other safety design provisions;*

*(2) The wheels are retracted (where applicable); and*

*(3) The occupant experiences the following ultimate inertia forces relative to the surrounding structure*

(i) *Upward-2.0 g.*

(ii) *Forward-9.0 g.*

(iii) *Sideward-1.5 g.*

(iv) *Downward-4.5 g, or any lesser force that will not be exceeded when the airplane absorbs the landing loads resulting from impact with an ultimate descent velocity of five f.p.s. at design landing weight.*

(c) *The supporting structure must be designed to restrain, under all loads up to those specified in paragraph (b)(3) of this section, each item of mass that could injure an occupant if it came loose in a minor crash landing.*

b. Guidance. Paragraph (b). When testing a seat to demonstrate compliance with the static requirements of § 25.561, the testing should be conducted with an occupant center of gravity (CG) location as defined in NAS 809 (referenced in Technical Standard Order (TSO) C39) and AS8049 (referenced in the current version of TSO-C127). This CG location should be utilized in any airplane interface load analysis conducted (Amendment 25-0)

12. AMENDMENT 25-23, Effective May 8, 1970.

a. Regulation.

(a) *The airplane, although it may be damaged in emergency landing conditions on land or water, must be designed as prescribed in this section to protect each occupant under those conditions.*

(b) *The structure must be designed to give each occupant every reasonable chance of escaping serious injury in a minor crash landing when—*

(1) *Proper use is made of seats, belts, and all other safety design provisions;*

(2) *The wheels are retracted (where applicable); and*

(3) *The occupant experiences the following ultimate inertia forces [acting separately] relative to the surrounding structure:*

(i) *Upward-2.0g.*

(ii) *Forward-9.0g.*

(iii) *Sideward-1.5*

(iv) *Downward-4.5g, or any lesser force that will not be exceeded when the airplane absorbs the landing loads resulting from impact with an ultimate descent velocity of five f.p.s. at design landing weight.*

*(c) The supporting structure must be designed to restrain, under all loads up to those specified in paragraph (b)(3) of this section, each item of mass that could injure an occupant if it came loose in a minor crash landing.*

b. **Guidance.** Paragraph (b). When testing a seat to demonstrate compliance with the static requirements of § 25.561, the testing should be conducted with an occupant center of gravity (CG) location as defined in NAS 809 (referenced in Technical Standard Order (TSO) C39) and AS8049 (referenced in the current version of TSO-C127). This CG location should be utilized in any airplane interface load analysis conducted. (Amendment 25-0)

13. AMENDMENT 25-64, Effective June 16, 1988.

a. **Regulation.**

*(a) The airplane, although it may be damaged in emergency landing conditions on land or water, must be designed as prescribed in this section to protect each occupant under those conditions.*

*(b) The structure must be designed to give each occupant every reasonable chance of escaping serious injury in a minor crash landing when—*

*(1) Proper use is made of seats, belts, and all other safety design provisions;*

*(2) The wheels are retracted (where applicable); and*

*(3) The occupant experiences the following ultimate inertia forces acting separately relative to the surrounding structure:*

*(i) [Upward, 3.0g.]*

*(ii) Forward, 9.0g.*

*(iii) [Sideward, 3.0g on the airframe; and 4.0g on the seats and their attachments.*

*(iv) Downward, 6.0g.*

*(v) Rearward, 1.5g]*

*(c) The supporting structure must be designed to restrain, under all loads up to those specified in paragraph (b)(3) of this section, each item of mass that could injure an occupant if it came loose in a minor crash landing.*

*[(d) Seats and items of mass (and their supporting structure) must not deform under any loads up to those specified in paragraph (b)(3) of this section in any manner that would impede subsequent rapid evacuation of occupants.]*

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### b. Guidance.

(1) Paragraph (b). When testing a seat to demonstrate compliance with the static requirements of § 25.561, the testing should be conducted with an occupant center of gravity (CG) location as defined in NAS 809 (referenced in Technical Standard Order (TSO) C39) and AS8049 (referenced in the current version of TSO-C127). This CG location should be utilized in any airplane interface load analysis conducted. (Amendment 25-0)

(2) Paragraph (d). The permanent deformations of items of mass, such as galleys and closets, located near exits should not interfere with the opening of those exits. Also, shared loading (loads imposed by the deformation of one furnishing onto an adjacent furnishing) between adjacent items of mass should be considered when determining maximum deformations. Refer to AC 25.562-1B “Dynamic Evaluation of Seat Restraint Systems & Occupant Protection on Transport Airplanes,” dated 1/19/96, Appendix 2 for policy concerning seat deformations for both §§ 25.561(d) and 25.562(c)(8). For § 25.561(d) only the forward, rearward, and sideward deformations are applicable. Deformations and possible load sharing between articles need only be considered for a common load case (e.g., 9g to 9g & 16g to 16g). The dynamic deflections of seats in particular do not have to be considered in conjunction with the static deflections of other articles when assessing possible load sharing. That is, when a seat substantiated under § 25.562 has interaction with another article substantiated under § 25.561, the assessment of load sharing is done using the § 25.561 deflections/reactions for both articles. (Amendment 25-64)

### 14. AMENDMENT 25-91, Effective July 29, 1997.

#### a. Regulation.

*(a) The airplane, although it may be damaged in emergency landing conditions on land or water, must be designed as prescribed in this section to protect each occupant under those conditions.*

*(b) The structure must be designed to give each occupant every reasonable chance of escaping serious injury in a minor crash landing when—*

*(1) Proper use is made of seats, belts, and all other safety design provisions;*

*(2) The wheels are retracted (where applicable); and*

*(3) The occupant experiences the following ultimate inertia forces relative to the surrounding structure:*

*(i) Upward, 3.0g.*

*(ii) Forward, 9.0g.*

*(iii) Sideward, 3.0g on the airframe; and 4.0g on the seats and their attachments.*

*(iv) Downward, 6.0g.*

*(v) Rearward, 1.5g.*

*[(c) For equipment, cargo in the passenger compartments and any other large masses, the following apply:*

*(1) Except as provided in paragraph (c)(2) of this section, these items must be positioned so that if they break loose, they will be unlikely to:*

*(i) Cause direct injury to occupants;*

*(ii) Penetrate fuel tanks or lines or cause fire or explosion hazard by damage to adjacent systems; or*

*(iii) Nullify any of the escape facilities provided for use after an emergency landing.*

*(2) When such positioning is not practical (e.g. fuselage mounted engines or auxiliary power units) each such item of mass shall be restrained under all loads up to those specified in paragraph (b)(3) of this section. The local attachments for these items should be designed to withstand 1.33 times the specified loads if these items are subject to severe wear and tear through frequent removal (e.g. quick change interior items).]*

*(d) Seats and items of mass (and their supporting structure) must not deform under any loads up to those specified in paragraph (b)(3) of this section in any manner that would impede subsequent rapid evacuation of occupants.*

b. Guidance.

(1) Paragraph (b). When testing a seat to demonstrate compliance with the static requirements of § 25.561, the testing should be conducted with an occupant center of gravity (CG) location as defined in NAS 809 (referenced in Technical Standard Order (TSO) C39) and AS8049 (referenced in the current version of TSO-C127). This CG location should be utilized in any airplane interface load analysis conducted. (Amendment 25-0)

(2) Paragraph (d). The permanent deformations of items of mass, such as galleys and closets, located near exits should not interfere with the opening of those exits. Also, shared loading (loads imposed by the deformation of one furnishing onto an adjacent furnishing) between adjacent items of mass should be considered when determining maximum deformations. Refer to AC 25.562-1B dated 1/10/2006, Appendix 2 for policy concerning seat deformations for both §§ 25.561(d) and 25.562(c)(8). For § 25.561(d) only the forward, rearward, and sideward deformations are applicable. Deformations and possible load sharing between articles need only be considered for a common load case (e.g., 9g to 9g & 16g to 16g). The dynamic deflections of seats in particular do not have to be considered in conjunction with the static deflections of other articles when assessing possible load sharing. That is, when a seat substantiated under § 25.562 has interaction with another article substantiated under § 25.561, the assessment of load sharing is done using the § 25.561 deflections/reactions for both articles. (Amendment 25-64)

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inadvertently opening the door. Although providing a restricted zone by means of a barrier may appear to conflict with the requirements of § 25.813 for an unobstructed passageway to Type I, and Type II emergency exits, it is considered that it would contribute sufficiently to the overall safety of the airplane occupants to be permitted. This device may be a rope, chain, rigid bar or gate. Such installations should be waist high to provide the maximum benefits for an adult and the end fastenings should be simple to make removal easy. It is not considered acceptable to install full-length auxiliary doors, but waist-high rigid gates would be acceptable provided they open toward the door and will not block the opening of the cabin door in any way. The locking means should be one, which could be easily overridden such as a spring-loaded ball type latch. (Amendment 25-0)

(ii) Flexible gates such as those made from webbing are not acceptable on the basis that persons may become entangled during an emergency egress. The use of a barrier to prevent persons from inadvertently opening the door in flight does not eliminate the need for a safety means to provide for possible malfunctioning of the primary locking mechanism; however, the auxiliary safety means covered above may eliminate the need for a restricted zone. (Amendment 25-0)

(6) Paragraph (e). Visual indicating system. The objective herein is to be able to ascertain by visual means that the door or locking means is sufficiently engaged to eliminate hazards emanating from an improperly closed door. Outward opening doors present a different problem from inward opening doors. (Amendment 25-0)

(i) The visual indicating system may consist of an indicator for each individual door, or a system connecting all doors in series. If the latter system is used, it need not necessarily show which door is not fully locked. (Amendment 25-0)

(ii) It is not necessary that more than one crewmember be able to ascertain by a visual signal that all external doors, normally used by the crew in supplying the airplane, or in loading and unloading passengers and cargo, are fully closed and locked. The visual signal should be located so that it may easily be seen by the appropriate crewmember from his station. (Amendment 25-0)

67. AMENDMENT 25-114, Effective June 2, 2004.

a. Regulation. This amendment revised the design standards for fuselage doors, hatches, and exits on transport category airplanes. It improved door integrity by providing design criteria that ensure doors remain secure under all circumstances that service experience has shown can happen. See <https://drs.faa.gov/browse/excelExternalWindow/5AB2D9F30472472786256E9B0069AB04.000>  
1.

b. Guidance. For guidance on this amendment, see AC 25.783-1A, “Fuselage Doors and Hatches,” dated April 25, 2005. (Amendment 25-114)

68 – 80. [RESERVED]

handhold, and meets the criteria identified above. Other interior features such as class dividers, closets and other monuments may also serve as acceptable handholds if they provide a surface for occupants to push against to steady themselves while moving about the cabin interior. (Amendment 25-0)

89. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.785(b) as follows:

\* \* \* \*

*(b) Each seat, berth, safety belt, harness, and adjacent part of the airplane at each station designated as occupiable during takeoff and landing must be designed so that a person making proper use of these facilities will not suffer serious injury in an emergency landing as a result of the inertia forces specified in §§ 25.561 and 25.562. [However, berths intended only for the carriage of medical patients (e.g., stretchers) need not comply with the requirements of § 25.562.]*

\* \* \* \*

b. Guidance. There is no new guidance for this amendment.

90 – 100. [RESERVED]

(F) The side restraint system should not present a tripping hazard either for ingress to the seat or egress to the aisle or to the evacuation route. (Amendment 25-32)

(G) The restraint system should not protrude into the aisle or evacuation route farther than the seat armrest on the aisle side. (Amendment 25-32)

(3) Paragraph (a). If overhead stowage compartments are intended for carriage of baggage, other than articles of loose clothing, they must be provided with approved restraining devices or doors (§ 121.589 (b)). (Amendment 25-32)

(4) Paragraph (a). The wording “a passenger seating configuration, excluding pilot seats, of 10 seats or more,” which was promulgated with the intent of being consistent with Amendment 23-10 to part 23, does not directly address seats intended for use by observers or flight attendants. Seats approved for use by observers or flight attendants are not included in the passenger seating configuration. Seats that have dual approval for occupancy by either crew/observers or passengers will be included in the passenger seating configuration. (Amendment 25-32)

(5) Paragraph (a). Compartments placarded “No Stowage” need not have a weight limit placard. Compartments placarded “Emergency Equipment Only” need not have a weight limit placard provided the compartment is filled with designated emergency equipment that does not exceed the compartment's limit. (Refer to paragraphs 801b(1)(ii), 1041b(5) and 1101b(2).) (Amendment 25-0)

(6) Paragraph (b). Baggage can be free if it can be shown that the forward barrier and cargo liner are able to restrain impact loads and the compartment is small enough to prevent significant shifts in center of gravity (c.g.). A 9g barrier net or other structure is required in all cargo versions if the cargo is not restrained to § 25.561 loads. In this case the cargo is restrained to flight and ground loads to prevent c.g. movement. If no 9g barrier net is used, the cargo is restrained to § 25.561 loads in an approved installation such as containers or pallets. (Refer to paragraph 1041b(8).) (Amendment 25-0)

(7) Paragraph (b). The intent of the last sentence of paragraph (b) is to prevent inadvertent opening of the latched doors of stowage compartments by specifically requiring that service wear and deterioration be considered in the design. This is not the same as the § 25.789 requirement that is directed to retention of items of mass subjected to maximum load factors. The installation of acceptable dual latching devices, each of which can withstand the applicable loads, has been found to be one means to show compliance with this rule. Refer to AC 25.785-1A, “Flight Attendant Seat and Torso Restraint System Installations,” dated 1/6/94, for additional information. (Amendment 25-51)

105 – 110. [RESERVED]

## SECTION 25.788 PASSENGER AMENITIES

111. Section 25.788 Did Not Exist Prior to Amendment 25-XXX.

112. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation.

(a) *Showers. If a shower cubicle is installed—*

(1) *Audio and visual “return to seat” indications must be provided and readily audible and visible to a shower cubicle occupant, and activated at the same time as the signs required by § 25.791(b);*

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

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

(4) *There must be means in the shower cubicle to enable persons to steady themselves in moderately rough air; and*

(5) *The shower cubicle must be designed in a way that precludes 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 a passenger compartment must not be a hazard to occupants when submitted to any of the following conditions—*

(1) *Each relevant flight and ground load condition of subpart C of this part (including the emergency landing conditions prescribed in § 25.561);*

(2) *Any load to be expected in service; and*

(3) *A cabin depressurization.*

(c) *Large Non-Structural Glass Panels. In addition to the requirements of paragraph (b) of this section, large non-structural glass panels installed in areas that are approved to be occupied during taxiing, takeoff, and landing or areas that a person has to enter or pass through to get to any emergency exit, must be glass that, when fractured, breaks into small pieces with relatively dull edges and must retain glass fragments.*

b. Guidance.

(1) Paragraphs (a). Refer to EASA CS-25 Book 2, AMC 25.788(a) and AMC 25.1447(c)(3) for guidance on one acceptable method of compliance.

(2) Paragraphs (b). Refer to EASA CS-25 Book 2, AMC 25.788(b) for guidance on one acceptable method of compliance, except the strength test is passed if no glass particles are expelled at any distance. Replace AMC 25.788(b), paragraph 2.1, “Strength Test,” with the following:

“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 no glass particles are expelled at any distance.”

(3) Paragraph (c). Refer to EASA CS-25 Book 2, AMC 25.603(a) for guidance on one acceptable method of compliance, except the strength test is passed if no glass particles are expelled at any distance. Replace AMC 25.603(a), paragraph 2.1, “Strength Test,” with the following:

“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 there no glass particles are expelled at any distance.”

113 – 120. [RESERVED]

SECTION 25.789 RETENTION OF ITEMS OF MASS

121. Section 25.789 Did Not Exist Prior to Amendment 25-32.

122. AMENDMENT 25-32, Effective May 1, 1972.

a. Regulation.

*Means must be provided to prevent each item of mass (that is part of the airplane type design) in a passenger or crew compartment from becoming a hazard by shifting*

*under the appropriate maximum load factors corresponding to the specified flight and ground load conditions, and to the emergency landing conditions of § 25.561(b).*

b. Guidance. The FAA issued policy memorandum ANM-115-05-001, dated October 28, 2004, and titled “Policy Statement on the Installation of “No Stowage” Placards on Surfaces Not Designed or Intended To Be Used for Stowage.” Appendix 14 of this AC contains the complete policy memorandum. (Amendment 25-32)

123. AMENDMENT 25-46, Effective December 1, 1978.

a. Regulation.

*[(a)] Means must be provided to prevent each item of mass (that is part of the airplane type design) in a passenger or crew compartment [or galley] from becoming a hazard by shifting under the appropriate maximum load factors corresponding to the specified flight and ground load conditions, and to the emergency landing conditions of § 25.561(b).*

*[(b) Each interphone restraint system must be designed so that when subjected to the load factors specified in § 25.561(b)(3), the interphone will remain in its stowed position.]*

b. Guidance.

(1) Note: Refer to paragraph 1041b for additional guidance material.  
(Amendment 25-46)

(2) Paragraph (a). Refer to AC 25.785-1A, “Flight Attendant Seat and Torso Restraint System Installations,” dated 1/6/94, for additional information. (Amendment 25-46)

(3) The FAA issued policy memorandum ANM-115-05-001, dated October 28, 2004, and titled “Policy Statement on the Installation of “No Stowage” Placards on Surfaces Not Designed or Intended To Be Used for Stowage.” Appendix 14 of this AC contains the complete policy memorandum. (Amendment 25-32)

124 – 140. [RESERVED]

#### SECTION 25.791 PASSENGER INFORMATION SIGNS

141. Section 25.791 Did Not Exist Prior to Amendment 25-32.

142. AMENDMENT 25-32, Effective May 1, 1972.

a. Regulation.

*When passenger information signs are installed to comply with the operating rules of this chapter, at least one sign (using either letters or symbols) notifying when smoking is prohibited and one sign (using either letters or symbols) notifying when safety belts should be fastened must, when illuminated, be legible to each person seated in the passenger cabin under all probable conditions of cabin illumination. Signs which notify when safety belts should be fastened and when smoking is prohibited must be so constructed that the crew can turn them on and off.*

b. Guidance.

(1) Each cabin occupant, including flight attendants but not pilot compartment occupants, should be able to Refer to a passenger information sign when seated in a seat occupiable for taxi, takeoff, and landing and for in-flight only seats. This should be accomplished for any seat position such as upright, reclined, swiveled, or tracked. The sign should be readable by a person with 20/20 vision. To read the sign, the head may be moved about to normal positions, but not rotated backwards (tilted). This evaluation should be conducted with 5th percentile female to 95th percentile male occupants. (Amendment 25-32)

(2) The words "FASTEN SEAT BELT" and "NO SMOKING" are acceptable. In remote areas, such as the lavatory or lower lobe galley, a sign with the words "RETURN TO SEAT" is acceptable. This sign should be operated by the same switch as the "FASTEN SEAT BELT" sign switch. (Amendment 25-32)

(3) In compartments where smoking is not allowed, it may be necessary to hardwire ON any lighted NO SMOKING signs to avoid confusing occupants. Note: this may affect an operator's ability to comply with § 121.317(a). The FAA issued a policy memorandum ANM-03-115-05, dated July 7, 2003, titled "Policy Statement and Equivalent Safety Finding on No Smoking Placards and Signs" that addresses this subject. Refer to related guidance in § 25.853, which includes portions of the policy memorandum ANM-03-115-05. (Amendment 25-32)

(4) Refer to Appendix 2 for acceptable symbols for these signs. (Amendment 25-32)

143. AMENDMENT 25-72, Effective August 20, 1990.

a. Regulation.

*Passenger information signs [and placards.]*

*[(a) If smoking is to be prohibited, there must be at least one placard so stating that is legible to each person seated in the cabin. If smoking is to be allowed, and if the crew compartment is separated from the passenger compartment, there must be at least one sign notifying when smoking is prohibited. Signs which notify when smoking is prohibited must be operable by a member of the flightcrew and, when illuminated, must be legible under all probable conditions of cabin illumination to each person seated in the cabin.*

*(b) Signs that notify when seat belts should be fastened and that are installed to comply with the operating rules of this chapter must be operable by a member of the flightcrew and, when illuminated, must be legible under all probable conditions of cabin illumination to each person seated in the cabin.*

*(c) A placard must be located on or adjacent to the door of each receptacle used for the disposal of flammable waste materials to indicate that use of the receptacle for disposal of cigarettes, etc., is prohibited.*

*(d) Lavatories must have "No Smoking" or "No Smoking in Lavatory" placards conspicuously located on or adjacent to each side of the entry door.*

*(e) Symbols that clearly express the intent of the sign or placard may be used in lieu of letters.]*

b. Guidance.

(1) Paragraph (a). In compartments where smoking is not allowed, it may be necessary to hardwire ON any lighted NO SMOKING signs to avoid confusing occupants. Note: this may affect an operator's ability to comply with § 121.317(a). The FAA issued a policy memorandum ANM-03-115-05, dated July 7, 2003, titled "Policy Statement and Equivalent Safety Finding on No Smoking Placards and Signs" that addresses this subject. Refer to related guidance in § 25.853, which includes portions of the policy memorandum ANM-03-115-05. (Amendment 25-32)

(2) Paragraph (a) and (b). Each cabin occupant, including flight attendants but not pilot compartment occupants, should be able to Refer to a passenger information sign when seated in a seat occupiable for taxi, takeoff, and landing and for in-flight only seats. This should be accomplished for any seat position such as upright, reclined, swiveled, or tracked. The sign should be readable by a person with 20/20 vision. To read the sign, the head may be moved about to normal positions, but not rotated backwards (tilted). This evaluation should be conducted with 5th percentile female to 95th percentile male occupants. (Amendment 25-32)

(3) Paragraph (a) and (b). The words "FASTEN SEAT BELT" and "NO SMOKING" are acceptable. In remote areas, such as the lavatory or lower lobe galley, a sign with the words "RETURN TO SEAT" is acceptable. This sign should be operated by the same switch as the "FASTEN SEAT BELT" sign switch. (Amendment 25-32)

(4) Paragraph (e). Refer to Appendix 2 for acceptable symbols for these signs. (Amendment 25-32)

144. Amendment 25-153, Effective October 22, 2024

a. Regulation

*Passenger information signs [and placards.]*

*[(a) Regarding "No Smoking" signs and placards:*

*(1) There must be at least one placard, or lighted sign, stating if smoking is prohibited. The placard or lighted sign must be legible to each person seated in the cabin.*

*(2) Lighted "No Smoking" signs must either be operable by a member of the flightcrew or be illuminated continuously during airplane operations. Illuminated signs must be legible under all probable conditions of cabin illumination to each person seated in the cabin.]*

*(b) Signs that notify when seat belts should be fastened and that are installed to comply with the operating rules of this chapter must be operable by a member of the flightcrew and, when illuminated, must be legible under all probable conditions of cabin illumination to each person seated in the cabin.*

*(c) A placard must be located on or adjacent to the door of each receptacle used for the disposal of flammable waste materials to indicate that use of the receptacle for disposal of cigarettes, etc., is prohibited.*

*(d) Lavatories must have "No Smoking" or "No Smoking in Lavatory" placards conspicuously located on or adjacent to each side of the entry door.*

*(e) Symbols that clearly express the intent of the sign or placard may be used in lieu of letters.*

b. Guidance.

(1) Paragraph (a). In compartments where smoking is not allowed and lighted NO SMOKING signs are hardwired ON, appropriate mechanisms such as switches should be available to the crew to safely remove power from the lighted signs during fault conditions without jeopardizing the operation of other essential loads or relying on pulling circuit breakers. (Amendment 25-153)

(2) Paragraph (a) and (b). Each cabin occupant, including flight attendants but not pilot compartment occupants, should be able to Refer to a passenger information sign when seated in a seat occupiable for taxi, takeoff, and landing and for in-flight only seats. This should be accomplished for any seat position such as upright, reclined, swiveled, or tracked. The sign should be readable by a person with 20/20 vision. To read the sign, the head may be moved about to normal positions, but not rotated backwards (tilted). This evaluation should be conducted with 5th percentile female to 95th percentile male occupants. (Amendment 25-32)

(3) Paragraph (a) and (b). The words "FASTEN SEAT BELT" and "NO SMOKING" are acceptable. In remote areas, such as the lavatory or lower lobe galley, a sign with the words "RETURN TO SEAT" is acceptable. This sign should be operated by the same switch as the "FASTEN SEAT BELT" sign switch. (Amendment 25-32)

(4) Paragraph (e). Refer to Appendix 2 for acceptable symbols for these signs. (Amendment 25-32)

145 – 160 [RESERVED]

## SECTION 25.793 FLOOR SURFACES

161. Section 25.793 Did Not Exist Prior to Amendment 25-51.

162. AMENDMENT 25-51, Effective March 6, 1980.

a. Regulation.

*The floor surface of all areas which are likely to become wet in service must have slip resistant properties.*

b. Guidance. Military Specifications Mil-W-5044B and Mil-W-5044C, titled “Walkway Compound, Nonslip and Walkway Matting, Nonslip,” measure dynamic coefficient of friction and provide an acceptable standard for the slip resistant properties when a minimum dynamic coefficient of friction of 0.45 is measured. This is an acceptable measure for this section and for § 25.803. (Amendment 25-51)

163 – 210. [RESERVED]

## SECTION 25.795 SECURITY CONSIDERATIONS

211. Section 25.795 Did Not Exist Prior to Amendment 25-106.

212. AMENDMENT 25-106, Effective January 15, 2002.

a. Regulation.

*[(a) Protection of flightdeck. If a flightdeck door is required by operating rules, the door installation must be designed to:*

*(1) Resist forcible intrusion by unauthorized persons and be capable of withstanding impacts of 300 Joules (221.3 foot-pounds) at the critical locations on the door, as well as a 250 pound (1113 Newtons) constant tensile load on the knob or handle, and*

*(2) Resist penetration by small arms fire and fragmentation devices to a level equivalent to level IIIa of the National Institute of Justice Standard (NIJ) 0101.04.*

*(b) [Reserved]]*

b. Guidance.

(1) Paragraph (a)(1). Refer to AC 25.795-1A, “Flightdeck Intrusion Resistance.” (Amendment 25-106)

(2) Paragraph (a)(1). Refer to Appendix 11, FAA Memorandum, 01-115-11, Original Release: dated November 6, 2001, Revision dated December 3, 2002, “Subject: Certification of Strengthened Flightdeck Doors on Transport Category Airplanes.” This memorandum outlines

acceptable means of compliance with this paragraph and many other regulatory requirements that were affected by Amendment 25-106. (Amendment 25-106)

(3) Paragraph (a)(2). Refer to AC 25.795-2A, “Flightdeck Penetration Resistance.” (Amendment 25-106)

(4) Paragraph (a)(2). Refer to Appendix 11, FAA Memorandum, 01-115-11, Original Release: dated November 6, 2001, Revision dated December 3, 2002, “Subject: Certification of Strengthened Flightdeck Doors on Transport Category Airplanes.” This memorandum outlines acceptable means of compliance with this paragraph and many other regulatory requirements that were affected by Amendment 25-106. (Amendment 25-106)

213 – 240. [RESERVED]

#### SECTION 25.797 REQUIREMENTS FOR CARRIAGE OF AUTHORIZED PERSONS ON ALL-CARGO AIRPLANES WITH CLASS E CARGO COMPARTMENTS

241. Section 25.797 Did Not Exist Prior to Amendment 25-XXX.

242. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation.

*(a) The limitations section of the airplane flight manual must:*

*(1) Prohibit the carriage of persons other than authorized persons identified in § 121.583;*

*(2) Indicate the maximum number of authorized persons;*

*(3) Prohibit occupancy of the cargo compartment during taxiing, takeoff, and landing; and*

*(4) Require a flightcrew member brief each authorized person before each flight on the following:*

*(i) Appropriate emergency procedures to ensure the safety of the flight,*

*(ii) The meaning of all alerts required by this section, and*

*(iii) That access to the Class E cargo compartment is prohibited during taxiing, takeoff, and landing.*

*(b) In lieu of the lighted sign requirements of § 25.791(b), the airplane must provide a flightcrew-operated alert system to inform the authorized persons when to fasten their seat belts.*

*(c) In lieu of the emergency exit size requirements of § 25.807(g)(1) and (i)(1), flightcrew exits may be designated for use by 9 or less authorized persons, provided the exit is*

*openable from the inside and the outside. The flightcrew exits must be demonstrated as a usable exit by test.*

*(d) In lieu of the means to permit viewing of the likely areas of evacuee ground contact requirements of § 25.809(a), for the exits designated for use by authorized persons, a means such as a fuselage-mounted emergency egress light must be installed to light the ground contact area.*

*(e) In lieu of the assist means requirements of § 25.810(a)(1), for the exits designated for use by authorized persons, approved emergency means to allow rapid evacuation must be provided for each occupant.*

*(f) If all seats for authorized persons are near the emergency exits, then the following need not be met:*

*(1) The floor proximity emergency escape path marking requirements of § 25.812(e);*

*(2) The transverse vertical separation requirements of § 25.812(l)(1); and*

*(3) The assist space requirements of § 25.813(b).*

*(g) If an automatically-presented oxygen dispensing system required by § 25.1447(c)(1) is not installed, an oxygen mask connected to an oxygen supply source must be provided for each authorized person and located so each authorized person can don the mask and start the flow of oxygen as necessary while seated.*

*(1) Each such oxygen mask and oxygen supply for use while seated must be sized to provide adequate oxygen for continuous and uninterrupted use during the worst-case flight duration following decompression and meet the minimum mass flow of supplemental oxygen requirements in § 25.1443(c).*

*(2) If portable oxygen units are installed to allow mobility, the portable oxygen units must meet the performance requirements of*

*(i) § 25.1443(a);*

*(ii) § 25.1443(b); or*

*(iii) The equipment must be shown to protect the authorized person from hypoxia at an activity level required to return to their seat following a rapid decompression to 25,000 feet cabin altitude.*

*(3) In lieu of crew determination if oxygen is being delivered to the dispensing units as required by § 25.1449, there must be a means to allow each authorized person to determine whether oxygen is being delivered to their portable oxygen dispensing equipment.*

*(4) An automatically activated aural alerting system must, in the case of a decompression, notify authorized persons when to don oxygen masks and initiate flow to the masks.*

*(h) There must be a means to allow authorized persons and the flight deck to communicate.*

*(1) A public address (PA) system meeting the requirements of § 25.1423 must be installed. The PA system must be audible throughout the occupiable compartments of the airplane and activated from either the flightdeck or from the seating area for the authorized persons.*

*(2) A means must be installed that provides two-way communication between the seating area for authorized persons and the flightdeck and is within reach of at least one of the authorized persons at their seat. This system must be independent of the PA system except for handsets, headsets, microphones, selector switches, and signaling devices.*

*(i) If certification permitting access into a Class E cargo compartment in-flight is requested, the compartment must meet the following requirements:*

*(1) In-flight access to the Class E cargo compartment is limited to a maximum of three authorized persons for the handling of hazardous or perishable cargo. If animals are carried as cargo, in-flight access is limited to a maximum of one authorized person for every four animals. The placard required by paragraph (k)(1) of this section must state the applicable limit on in-flight access.*

*(2) Full-face portable oxygen equipment meeting the requirements of paragraph (g)(2) through (4) of this section and the protective breathing equipment requirements of § 25.1439(b)(1), (2), and (4) must be provided for each authorized person outside the compartment.*

*(j) The following alert systems must be installed, and be recognizable in all accessible areas such as the lavatory, the flight deck, any occupied compartment forward of the Class E cargo compartment, and the Class E cargo compartment at all occupant locations and orientations, during all expected operational conditions, including a rapid decompression where moisture in the air may condense:*

*(1) In the event of decompression, an automatically activated aural alerting system must notify authorized persons to don oxygen masks and immediately return to their seats, initiate flow to the masks, and ensure that the access provisions necessary to prevent smoke penetration into occupied areas have been secured.*

*(2) In the event of smoke or fire detection, a visual alerting system must notify authorized persons to don oxygen masks and immediately return to their seats and must ensure that the access provisions necessary to prevent smoke penetration into occupied areas have been secured.*

*(3) In the event of turbulence and prior to taxiing, takeoff, and landing, regardless of whether handholds are installed to show compliance with § 25.785(j), an alerting system must notify authorized persons to immediately return to their seats and ensure that the access provisions necessary to prevent smoke penetration into occupied areas have been secured.*

*(k) Placards must be installed in a conspicuous location in the seating area for the authorized persons on or adjacent to the access means to the cargo compartment and must provide the following information:*

*(1) The limit on the number of authorized persons permitted in-flight access to the cargo compartment.*

*(2) That occupancy of the cargo compartment is prohibited during taxiing, takeoff, and landing.*

*(3) That each authorized person must carry a portable oxygen unit with full face mask while inside the cargo compartment.*

*(4) The actions authorized persons must do in the event of different alerts.*

*(5) That smoking is not allowed within the cargo compartment.*

*(6) That the access provisions necessary to prevent smoke penetration into occupied areas must be secured except when entering or leaving the cargo compartment.*

*(7) That the cargo compartment must not be entered in case of fire or smoke being detected inside that compartment.*

*(8) That when authorized persons are carried, the seat position within reach of the two-way communication system required by paragraph (h)(2) of this section must be occupied for taxiing, takeoff, and landing.*

*(l) Flight tests must be conducted in accordance with § 25.855(h) to show compliance with the provisions of § 25.857 concerning the entry of hazardous quantities of smoke into the occupied areas. The test must account for the time to evacuate authorized persons from the main deck cargo compartment through open access provisions necessary to prevent smoke penetration into occupied areas. Occupancy of the main deck Class E cargo compartment must be limited based on the results of these tests, and identified by the placard required in paragraph (k)(1) of this section.*

b. Guidance. The FAA Order 8900.1 volume 3 chapter 48, “Flight Standards Information Management System”, and AC 120-85, “Air Cargo Operations”, include the requirements of physical capabilities, training, and provision of aircraft familiarization knowledge for authorized persons that would then be documented in the appropriate operations specifications and FAA-approved or FAA-accepted manuals of the cargo operator.

243 – 250. [RESERVED]

tests. Section 25.533, “Hull and Main Float Bottom Pressure Loads,” may be a source of some pressure information if similarity can be shown. The use of pressure distribution data from similar model airplanes is acceptable and is preferred over purely analytical methods.  
(Amendment 25-0)

253. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.801(a) as follows:

*(a) If certification with ditching provisions is requested, the airplane must meet the requirements of this section and §§ [25.807(i)], 25.1411, and 25.1415(a).*

\* \* \* \*

b. Guidance. There is no new guidance for this amendment.

254 – 270. [RESERVED]

AFM should include a preflight checklist in the Procedures Section requiring the lock pin removal. (Amendment 25-0)

(4) Paragraphs (b)(1) and (f)(1)(iii).

(i) All combinations of landing gear collapse must be considered.

(ii) Conditions analyzed will typically involve three ground contact points (e.g., nose gear, main gear, forward fuselage, wing box, aft fuselage, engine wing).

(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

(iv) Conditions where the airplane CG is not within the triangle formed by the three contact points (in the plan view) may be excluded, since the airplane would not be in a stable condition.

(v) The landing gear oleo setting, tire pressure and other rigging-dependent tolerances should be at their individual average values.

(vi) The landing gear strut and tire compression should be based on the gross weight and CG location used above.

(vii) The landing gear ground contact points should consider the intersection of the landing gear post centerline with the static ground plane or the planar centroid of the centers of each tire contact area on the static ground plane, whichever is more appropriate for the landing gear design.

(viii) For passenger exits, the sill height is measured from the centerline of the door sill. For the flight crew exits, the measurement is taken from the lowest point of the exit opening in whichever condition is being analyzed. For over-wing emergency exits requiring an assist means per § 25.809(h), the wing height should be established and measured at a representative point considering the escape route on the wing and the design and integration of the associated assist means.

(ix) The deflections and/or deformations associated with the static ground contact forces may be considered. This includes adjustments to landing gear strut and tire compression due to any changes in the landing gear post loads, nacelle crush and engine strut deflections. The dynamic effects of a crash event do not need to be considered (e.g., fuselage crush beyond what would be expected in a static condition, loss of engine(s)).

(x) Airplane pitch and roll angles are measured relative to the ground plane.

(xi) For adverse attitude conditions where the height of the forward fuselage has increased compared to the normal attitude condition, it may be assumed that the nose gear remains attached but is off the ground. (Amendment 32)

(5) Paragraph (c). The exits should be openable when the fuselage is pressurized to the maximum allowed for takeoff and landing. Usually, this pressure is about 0.125 psi. If design features such as automatic bleed-off, would make this full pressure unlikely, the exits should be openable at whatever pressure can reasonably be expected after taxi, rejected takeoff (RTO), or minor crash landing. (Amendment 25-0)

(6) Paragraph (e). A hole in the fuselage, such as an exit, inevitably has stronger structure surrounding it and is an acceptable provision. Clearances to account for deflections such as the doors, structure, and hinges, are also provisions. A minor crash landing is one in which the ultimate inertia forces of § 25.561(b)(3) are experienced. (Amendment 25-0)

(7) Paragraph (f). Part 25 addresses requirements for crew and passenger occupants only. It did not envision, nor does it specifically address an increasingly common category of occupant approved (by exemption to part 25) for freighter airplanes: supernumeraries (reference § 121.583). Supernumeraries are typically employed in some fashion to facilitate the movement or care of cargo and passengers, generally receive some degree of training over and above that possessed by passengers. Additionally, relatively few of them are accommodated onboard any airplane. Consequently, the terms of each exemption approving the carriage of supernumeraries are tailored to the installations and training involved. But in general, the FAA has conservatively considered supernumeraries to be more like passengers than crew and encourages and expects supernumeraries to be afforded the same overall level of safety as for passengers, to the maximum extent practicable—except that, for supernumeraries, more consideration is permitted for training and other special circumstances to achieve the requisite level of safety. For example, escape slides have typically been retained on freighter conversions. But in some limited special instances, inertial reels have been approved in lieu of slides. (Amendment 25-0)

(8) Paragraph (f)(1)(i). There should be a positive visual means of determining girt bar engagement to assure that the assisting means can be automatically deployed. (Amendment 25-15)

(9) Paragraph (f)(1)(i). Passenger doors are those that can be expected to be used for normal passenger loading. Current airport terminal passenger loading facilities should be considered. An emergency exit qualifies as a service door if such as a galley or service bar is adjacent to the exit. An exit is not a service door if the galley is on the other side of the airplane with its own door. When the interior is used in more than one configuration, where the exit is a service door at times and solely an emergency exit at other times, the rule always allows fully automatic slides, or conversion from automatically inflated to manually inflated as the exit status varies. Since the second option may be impractical, the use of fully automatic slides always would be acceptable. The FAA considers that fully automatic slides may be hazardous to ground personnel and may find it acceptable to install a warning placard or red webbing stretched across the door window. A manual inflation handle with placarding is an acceptable different manner for slide erection. (Amendment 25-15)

(10) Paragraph (f)(1)(i). A passenger entrance door and service door are defined the same as that for passenger doors and service doors in paragraph 354b (9). (Amendment 25-32)

(11) Paragraph (f)(1)(iii). To be self-supporting, the bottom end of the slide should rest on the ground. If it does not rest on the ground, the slide must be usable and look usable to passengers. When the passenger uses the slide, the bottom end should rest on the ground and allow the passenger to egress, the slide readily. (Amendment 25-15)

(12) Paragraph (f)(1)(iii). Collapse of any one or more landing gear legs will cause the slide angle to vary from the normal angle. At these various angles, it may be acceptable if the assisting means is safely usable by normal, healthy passengers. If this is not obvious by inspection, it should be demonstrated by test. The evacuation rate need not be the same as that with a normal angle. The adverse attitude also should be evaluated for the cockpit emergency egress provisions. (Amendment 25-15)

(13) Paragraph (f)(2). Large transport airplanes typically have heights from cockpit windows and/or floor level exits to the ground that may preclude the use of ropes as an acceptable assist means for egress. Demonstrations have shown that typical occupants do not have the upper body strength and/or stamina to descend a rope over longer distances without unacceptable slipping and/or falling. Consequently, alternative means, such as inertia reels or slides should be utilized, as appropriate. (Amendment 25-0)

(14) Paragraph (f)(2). Usability of the rope should be demonstrated by a 5<sup>th</sup> percentile female (approximately 60-inches tall and weighing no more than 102 lbs.) as well as a 95<sup>th</sup> percentile male (approximately 74-inches tall and weighing no less than 210 lbs.). (Amendment 25-0)

(15) Paragraph (h). The guidance stated in paragraph 354b (13) of this AC applies to this amendment except paragraph 354b(13)(iv), as applied here, should read: "*The flap setting should be the highest takeoff or landing setting allowed in the AFM.*" (Amendment 25-32)

(16) Paragraph (h). The six feet above the ground may be measured as follows: (Amendment 25- 15)

(i) At the lowest point along the required escape route, (Amendment 25-15)

(ii) When the airplane is on level ground, (Amendment 25-15)

(iii) The gross weight and center of gravity (c.g.) location should be considered for a typical takeoff configuration for the critical flap setting, (Amendment 25-15)

(iv) The flap setting should be the highest landing setting allowed in the AFM, (Amendment 25-15)

## Draft for Public Comment

(v) The landing gear oleo setting, tire pressure and any other rigging dependent tolerances should be at their individual average values, and (Amendment 25-15)

(vi) The landing gear strut and tire compression should be based on the gross weight and c.g. location used in paragraph (15)(iii) above. (Amendment 25-15)

### 356. AMENDMENT 25-34, Effective December 31, 1972

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/42B6073445F438F28525667200519C29.0001>

b. Guidance.

(1) Paragraph (b). Other approved exits should be usable for rescue personnel to assist incapacitated flight crewmembers. If a cockpit flightcrew exit is not openable from the outside on the left side, another approved exit that is openable from the outside should be on the left side. The same applies to the right side. Also refer to § 25.805. The evaluation that an exit is openable from both inside and outside of the airplane, the adjacent seats must be positioned in the most adverse position of the seat including seat translation, seat rotation, seat back recline, seat back breakover, and seat tracking. (Amendment 25-0)

(2) Paragraph (b). Some airplanes initially certificated as passenger configurations may include cockpit windows that are openable only from the inside. On those airplanes, convenient and readily accessible passenger exits on both sides of the fuselage, that are openable from both the inside and outside, have been approved to comply with this requirement. When these airplanes are reconfigured as cargo-only airplanes, with an accompanying proposal to deactivate one of these passenger doors, provision must be made for continued compliance with this requirement (e.g., reconfiguring the cockpit window on that side so that it is openable from the outside). (Amendment 25-0)

(3) Paragraph (b). The requirement that each emergency exit be openable from the inside and outside does not apply when the airplane is parked and unoccupied. It is acceptable to have locks that prevent unauthorized entry provided there are also satisfactory means to ensure that the locks are disengaged prior to passenger boarding. Such satisfactory means will vary depending on the size and complexity of the airplane. Cockpit annunciator lights are not necessary unless the emergency exits are so remotely located or numerous that lock disengagement might be overlooked. A lock pin with a red flag in an exit is satisfactory. The AFM should include a preflight checklist in the Procedures Section requiring the lock pin removal. (Amendment 25-0)

(4) Paragraphs (b)(1) and (f)(1)(iii).

(i) All combinations of landing gear collapse must be considered.

## Draft for Public Comment

(ii) Conditions analyzed will typically involve three ground contact points (e.g., nose gear, main gear, forward fuselage, wing box, aft fuselage, engine wing).

(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

(iv) Conditions where the airplane CG is not within the triangle formed by the three contact points (in the plan view) may be excluded, since the airplane would not be in a stable condition.

(v) The landing gear oleo setting, tire pressure and other rigging-dependent tolerances should be at their individual average values.

(vi) The landing gear strut and tire compression should be based on the gross weight and CG location used above.

(vii) The landing gear ground contact points should consider the intersection of the landing gear post centerline with the static ground plane or the planar centroid of the centers of each tire contact area on the static ground plane, whichever is more appropriate for the landing gear design.

(viii) For passenger exits, the sill height is measured from the centerline of the door sill. For the flight crew exits, the measurement is taken from the lowest point of the exit opening in whichever condition is being analyzed. For over-wing emergency exits requiring an assist means per § 25.809(h), the wing height should be established and measured at a representative point considering the escape route on the wing and the design and integration of the associated assist means.

(ix) The deflections and/or deformations associated with the static ground contact forces may be considered. This includes adjustments to landing gear strut and tire compression due to any changes in the landing gear post loads, nacelle crush and engine strut deflections. The dynamic effects of a crash event do not need to be considered (e.g., fuselage crush beyond what would be expected in a static condition, loss of engine(s)).

(x) Airplane pitch and roll angles are measured relative to the ground plane.

(xi) For adverse attitude conditions where the height of the forward fuselage has increased compared to the normal attitude condition, it may be assumed that the nose gear remains attached but is off the ground. (Amendment 32)

(5) Paragraph (c). The exits should be openable when the fuselage is pressurized to the maximum allowed for takeoff and landing. Usually, this pressure is about 0.125 psi. If design features such as automatic bleed-off, would make this full pressure unlikely, the exits should be openable at whatever pressure can reasonably be expected after taxi, rejected takeoff (RTO), or minor crash landing. (Amendment 25-0)

(6) Paragraph (e). A hole in the fuselage, such as an exit, inevitably has stronger structure surrounding it and is an acceptable provision. Clearances to account for deflections such as the doors, structure, and hinges, are also provisions. A minor crash landing is one in which the ultimate inertia forces of § 25.561(b)(3) are experienced. (Amendment 25-0)

(7) Paragraph (f). Part 25 addresses requirements for crew and passenger occupants only. It did not envision, nor does it specifically address an increasingly common category of occupant approved (by exemption to part 25) for freighter airplanes: supernumeraries (reference § 121.583). Supernumeraries are typically employed in some fashion to facilitate the movement or care of cargo and passengers, generally receive some degree of training over and above that possessed by passengers. Additionally, relatively few of them are accommodated onboard any airplane. Consequently, the terms of each exemption approving the carriage of supernumeraries are tailored to the installations and training involved. But in general, the FAA has conservatively considered supernumeraries to be more like passengers than crew and encourages and expects supernumeraries to be afforded the same overall level of safety as for passengers, to the maximum extent practicable—except that, for supernumeraries, more consideration is permitted for training and other special circumstances to achieve the requisite level of safety. For example, escape slides have typically been retained on freighter conversions. But in some limited special instances, inertial reels have been approved in lieu of slides. (Amendment 25-0)

(8) Paragraph (f)(1)(i). There should be a positive visual means of determining girt bar engagement to assure that the assisting means can be automatically deployed. (Amendment 25-15)

(9) Paragraph (f)(1)(i). Passenger doors are those that can be expected to be used for normal passenger loading. Current airport terminal passenger loading facilities should be considered. An emergency exit qualifies as a service door if such as a galley or service bar is adjacent to the exit. An exit is not a service door if the galley is on the other side of the airplane with its own door. When the interior is used in more than one configuration, where the exit is a service door at times and solely an emergency exit at other times, the rule always allows fully automatic slides, or conversion from automatically inflated to manually inflated as the exit status varies. Since the second option may be impractical, the use of fully automatic slides always would be acceptable. The FAA considers that fully automatic slides may be hazardous to ground personnel and may find it acceptable to install a warning placard or red webbing stretched across the door window. A manual inflation handle with placarding is an acceptable different manner for slide erection. (Amendment 25-15)

(10) Paragraph (f)(1)(i). A passenger entrance door and service door are defined the same as that for passenger doors and service doors in paragraph 354b(9). (Amendment 25-32)

(11) Paragraph (f)(1)(iii). To be self-supporting, the bottom end of the slide should rest on the ground. If it does not rest on the ground, the slide must be usable and look usable to passengers. When the passenger uses the slide, the bottom end should rest on the ground and allow the passenger to egress, the slide readily. (Amendment 25-15)

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(12) Paragraph (f)(1)(iii). Collapse of any one or more landing gear legs will cause the slide angle to vary from the normal angle. At these various angles, it may be acceptable if the assisting means is safely usable by normal, healthy passengers. If this is not obvious by inspection, it should be demonstrated by test. The evacuation rate need not be the same as that with a normal angle. The adverse attitude also should be evaluated for the cockpit emergency egress provisions. (Amendment 25-15)

(13) Paragraph (f)(2). Large transport airplanes typically have heights from cockpit windows and/or floor level exits to the ground that may preclude the use of ropes as an acceptable assist means for egress. Demonstrations have shown that typical occupants do not have the upper body strength and/or stamina to descend a rope over longer distances without unacceptable slipping and/or falling. Consequently, alternative means, such as inertia reels or slides should be utilized, as appropriate. (Amendment 25-0)

(14) Paragraph (f)(2). Usability of the rope should be demonstrated by a 5<sup>th</sup> percentile female (approximately 60-inches tall and weighing no more than 102 lbs) as well as a 95<sup>th</sup> percentile male (approximately 74-inches tall and weighing no less than 210 lbs). (Amendment 25-0)

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(i) At the lowest point along the required escape route, (Amendment 25-15)

(ii) When the airplane is on level ground, (Amendment 25-15)

(iii) The gross weight and center of gravity (c.g.) location should be considered for a typical takeoff configuration for the critical flap setting, (Amendment 25-15)

(iv) The flap setting should be the highest landing setting allowed in the AFM, (Amendment 25-15)

(v) The landing gear oleo setting, tire pressure and any other rigging dependent tolerances should be at their individual average values, and (Amendment 25-15)

(vi) The landing gear strut and tire compression should be based on the gross weight and c.g. location used in paragraph (14)(iii) above. (Amendment 25-15)

357. AMENDMENT 25-46, Effective December 1, 1978.

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/766DD339DA7F452F852566720051B3A3.0001>

b. Guidance.

(1) Paragraph (b). Other approved exits should be usable for rescue personnel to assist incapacitated flight crewmembers. If a cockpit flightcrew exit is not openable from the outside on the left side, another approved exit that is openable from the outside should be on the left side. The same applies to the right side. Also refer to § 25.805. The evaluation that an exit is openable from both inside and outside of the airplane, the adjacent seats must be positioned in the most adverse position of the seat including seat translation, seat rotation, seat back recline, seat back breakover, and seat tracking. (Amendment 25-0)

(2) Paragraph (b). Some airplanes initially certificated as passenger configurations may include cockpit windows that are openable only from the inside. On those airplanes, convenient and readily accessible passenger exits on both sides of the fuselage, that are openable from both the inside and outside, have been approved to comply with this requirement. When these airplanes are reconfigured as cargo-only airplanes, with an accompanying proposal to deactivate one of these passenger doors, provision must be made for continued compliance with this requirement (e.g., reconfiguring the cockpit window on that side so that it is openable from the outside). (Amendment 25-0)

(3) Paragraph (b). The requirement that each emergency exit be openable from the inside and outside does not apply when the airplane is parked and unoccupied. It is acceptable to have locks that prevent unauthorized entry provided there are also satisfactory means to ensure that the locks are disengaged prior to passenger boarding. Such satisfactory means will vary depending on the size and complexity of the airplane. Cockpit annunciator lights are not necessary unless the emergency exits are so remotely located or numerous that lock disengagement might be overlooked. A lock pin with a red flag in an exit is satisfactory. The AFM should include a preflight checklist in the Procedures Section requiring the lock pin removal. (Amendment 25-0)

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(i) All combinations of landing gear collapse must be considered.

(ii) Conditions analyzed will typically involve three ground contact points (e.g., nose gear, main gear, forward fuselage, wing box, aft fuselage, engine wing).

(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

(iv) Conditions where the airplane CG is not within the triangle formed by the three contact points (in the plan view) may be excluded, since the airplane would not be in a stable condition.

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(v) The landing gear oleo setting, tire pressure and other rigging-dependent tolerances should be at their individual average values.

(vi) The landing gear strut and tire compression should be based on the gross weight and CG location used above.

(vii) The landing gear ground contact points should consider the intersection of the landing gear post centerline with the static ground plane or the planar centroid of the centers of each tire contact area on the static ground plane, whichever is more appropriate for the landing gear design.

(viii) For passenger exits, the sill height is measured from the centerline of the door sill. For the flight crew exits, the measurement is taken from the lowest point of the exit opening in whichever condition is being analyzed. For over-wing emergency exits requiring an assist means per § 25.809(h), the wing height should be established and measured at a representative point considering the escape route on the wing and the design and integration of the associated assist means.

(ix) The deflections and/or deformations associated with the static ground contact forces may be considered. This includes adjustments to landing gear strut and tire compression due to any changes in the landing gear post loads, nacelle crush and engine strut deflections. The dynamic effects of a crash event do not need to be considered (e.g., fuselage crush beyond what would be expected in a static condition, loss of engine(s)).

(x) Airplane pitch and roll angles are measured relative to the ground plane.

(xi) For adverse attitude conditions where the height of the forward fuselage has increased compared to the normal attitude condition, it may be assumed that the nose gear remains attached but is off the ground. (Amendment 32)

(5) Paragraph (c). The exits should be openable when the fuselage is pressurized to the maximum allowed for takeoff and landing. Usually, this pressure is about 0.125 psi. If design features such as automatic bleed-off, would make this full pressure unlikely, the exits should be openable at whatever pressure can reasonably be expected after taxi, rejected takeoff (RTO), or minor crash landing. (Amendment 25-0)

(6) Paragraph (e). A hole in the fuselage, such as an exit, inevitably has stronger structure surrounding it and is an acceptable provision. Clearances to account for deflections such as the doors, structure, and hinges, are also provisions. A minor crash landing is one in which the ultimate inertia forces of § 25.561(b)(3) are experienced. (Amendment 25-0)

(7) Paragraph (f). Part 25 addresses requirements for crew and passenger occupants only. It did not envision, nor does it specifically address an increasingly common category of occupant approved (by exemption to part 25) for freighter airplanes: supernumeraries (reference § 121.583). Supernumeraries are typically employed in some fashion to facilitate the movement or care of cargo and passengers, generally receive some degree of training over and above that

possessed by passengers. Additionally, relatively few of them are accommodated onboard any airplane. Consequently, the terms of each exemption approving the carriage of supernumeraries are tailored to the installations and training involved. But in general, the FAA has conservatively considered supernumeraries to be more like passengers than crew and encourages and expects supernumeraries to be afforded the same overall level of safety as for passengers, to the maximum extent practicable—except that, for supernumeraries, more consideration is permitted for training and other special circumstances to achieve the requisite level of safety. For example, escape slides have typically been retained on freighter conversions. But in some limited special instances, inertial reels have been approved in lieu of slides. (Amendment 25-0)

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(13) Paragraph (f)(1)(iv). (Amendment 25-46)

(i) The person who assists should come from the airplane. This capability should be demonstrated by test. (Amendment 25-46)

(ii) Escape slides that deploy in front of an engine inlet may need to be assessed for the effect of the inlet airflow on the acceptable deployment of the escape slide. Since the wind condition is assumed, the effect of the inlet airflow should be considered in combination with the 25-knot wind. The effect of the engine is non-linear with respect to distance from the inlet, so that tests that do not use an actual running engine should contain conservative conditions or assumptions to ensure that the installation is acceptable. For example, adding the effect of the engine (at specific distance from the inlet) to the wind velocity, and then verifying that the slide will come no closer to the engine than that distance is an acceptable method. (Amendment 25-46)

(14) Paragraph (f)(1)(v). The five tests should be conducted for each individual exit. For instance, if there are a total of four Type I exits in the airplane and each exit with each slide installation is identical, a total of 20 deployment and inflation tests should be conducted, five on each exit. A lesser number of tests may be acceptable for a modification to the system installation or slide design. (Amendment 25-46)

(15) Paragraph (f)(1)(v). The packed escape slide as installed in the airplane, up to and including the hardware that attaches the slide to the door, should be subjected to the specified inertia forces. Each escape slide used in the test program should be subjected to the inertia forces but need not be subjected to the inertia forces more than once, even though it may be tested more than once. (Amendment 25-46)

(16) Paragraph (f)(1)(iv) and (v). For wind or repeatability tests, as many deployments as possible should be done on an airplane. When using a mockup (also known as a module) for these tests, the following items, as a minimum, should be satisfactorily addressed: (Amendment 25-46)

(i) The door on the mockup should be a full-size door built as close to a production door as possible, using production hardware or prototype equivalents. This is especially critical with respect to the girt bar, floor fittings, pack board, bustle, the door motion, door velocity throughout the range of travel, and the way the slide drops. (Amendment 25-46)

(ii) The fuselage contour and skin surface of the mockup which might be contacted by the slide, under any normal or adverse attitude or wind conditions, should be the same as the airplane contour. Additionally, fuselage protuberances such as pitot-static tubes and outflow valves should be accurately represented. (Amendment 25-46)

(iii) The impingement of the wind on the slide should be shown by aerodynamic analysis to be equal or greater than that on the airplane. (Amendment 25-46)

(17) Paragraph (f)(2). Large transport airplanes typically have heights from cockpit windows and/or floor level exits to the ground that may preclude the use of ropes as an acceptable assist means for egress. Demonstrations have shown that typical occupants do not have the upper body strength and/or stamina to descend a rope over longer distances without unacceptable slipping and/or falling. Consequently, alternative means, such as inertia reels or slides should be utilized, as appropriate. (Amendment 25-0)

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(18) Paragraph (f)(2). Usability of the rope should be demonstrated by a 5<sup>th</sup> percentile female (approximately 60-inches tall and weighing no more than 102 lbs.) as well as a 95<sup>th</sup> percentile male (approximately 74-inches tall and weighing no less than 210 lbs.). (Amendment 25-0)

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(20) Paragraph (h). The six feet above the ground may be measured as follows: (Amendment 25-15)

(i) At the lowest point along the required escape route, (Amendment 25-15)

(ii) When the airplane is on level ground, (Amendment 25-15)

(iii) The gross weight and center of gravity (c.g.) location should be considered for a typical takeoff configuration for the critical flap setting, (Amendment 25-15)

(iv) The flap setting should be the highest landing setting allowed in the AFM, (Amendment 25-15)

(v) The landing gear oleo setting, tire pressure and any other rigging dependent tolerances should be at their individual average values, and (Amendment 25-15)

(vi) The landing gear strut and tire compression should be based on the gross weight and c.g. location used in paragraph (19)(iii) above. (Amendment 25-15)

358. AMENDMENT 25-47, Effective December 24, 1979.

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/F8EB9341ACC3298C852566720051B822.0001>

b. Guidance.

(1) Paragraph (b). Other approved exits should be usable for rescue personnel to assist incapacitated flight crewmembers. If a cockpit flightcrew exit is not openable from the outside on the left side, another approved exit that is openable from the outside should be on the left side. The same applies to the right side. Also refer to § 25.805. The evaluation that an exit is openable from both inside and outside of the airplane, the adjacent seats must be positioned in the most adverse position of the seat including seat translation, seat rotation, seat back recline, seat back breakover, and seat tracking. (Amendment 25-0)

## Draft for Public Comment

(2) Paragraph (b). Some airplanes initially certificated as passenger configurations may include cockpit windows that are openable only from the inside. On those airplanes, convenient and readily accessible passenger exits on both sides of the fuselage, that are openable from both the inside and outside, have been approved to comply with this requirement. When these airplanes are reconfigured as cargo-only airplanes, with an accompanying proposal to deactivate one of these passenger doors, provision must be made for continued compliance with this requirement (e.g., reconfiguring the cockpit window on that side so that it is openable from the outside). (Amendment 25-0)

(3) Paragraph (b). The requirement that each emergency exit be openable from the inside and outside does not apply when the airplane is parked and unoccupied. It is acceptable to have locks that prevent unauthorized entry provided there are also satisfactory means to ensure that the locks are disengaged prior to passenger boarding. Such satisfactory means will vary depending on the size and complexity of the airplane. Cockpit annunciator lights are not necessary unless the emergency exits are so remotely located or numerous that lock disengagement might be overlooked. A lock pin with a red flag in an exit is satisfactory. The AFM should include a preflight checklist in the Procedures Section requiring the lock pin removal. (Amendment 25-0)

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(i) All combinations of landing gear collapse must be considered.

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(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

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(x) Airplane pitch and roll angles are measured relative to the ground plane.

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(5) Paragraph (c). The exits should be openable when the fuselage is pressurized to the maximum allowed for takeoff and landing. Usually, this pressure is about 0.125 psi. If design features such as automatic bleed-off, would make this full pressure unlikely, the exits should be openable at whatever pressure can reasonably be expected after taxi, rejected takeoff (RTO), or minor crash landing. (Amendment 25-0)

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(8) Paragraph (f)(1)(i). There should be a positive visual means of determining girt bar engagement to assure that the assisting means can be automatically deployed. (Amendment 25-15)

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(10) Paragraph (f)(1)(i). A passenger entrance door and service door are defined the same as that for passenger doors and service doors in paragraph 354b (9). (Amendment 25-32)

(11) Paragraph (f)(1)(iii). To be self-supporting, the bottom end of the slide should rest on the ground. If it does not rest on the ground, the slide must be usable and look usable to passengers. When the passenger uses the slide, the bottom end should rest on the ground and allow the passenger to egress, the slide readily. (Amendment 25-15)

(12) Paragraph (f)(1)(iii). To meet the 25-knot wind requirement, the escape slide presses against the fuselage and the end of the unoccupied slide may not be in physical contact with the ground, especially in the most adverse attitude (gear collapse). This condition has been found to be acceptable provided the slide is self-supporting on the ground shortly after an evacuee has entered the slide and prior to the evacuee reaching the end of the slide. The unoccupied slide, when viewed from the exit, should not give the visual impression that the slide is unsafe for use. (Amendment 25-47)

(13) Paragraph (f)(1)(iii). Collapse of any one or more landing gear legs will cause the slide angle to vary from the normal angle. At these various angles, it may be acceptable if the assisting means is safely usable by normal, healthy passengers. If this is not obvious by inspection, it should be demonstrated by test. The evacuation rate need not be the same as that with a normal angle. The adverse attitude also should be evaluated for the cockpit emergency egress provisions. (Amendment 25-15)

(14) Paragraph (f)(1)(iv). (Amendment 25-46)

(i) The person who assists should come from the airplane. This capability should be demonstrated by test. (Amendment 25-46)

(ii) Escape slides that deploy in front of an engine inlet may need to be assessed for the effect of the inlet airflow on the acceptable deployment of the escape slide. Since the wind condition is assumed, the effect of the inlet airflow should be considered in combination with the 25-knot wind. The effect of the engine is non-linear with respect to distance from the inlet, so that tests that do not use an actual running engine should contain conservative conditions or

assumptions to ensure that the installation is acceptable. For example, adding the effect of the engine (at specific distance from the inlet) to the wind velocity, and then verifying that the slide will come no closer to the engine than that distance is an acceptable method. (Amendment 25- 46)

(15) Paragraph (f)(1)(v). The five tests should be conducted for each individual exit. For instance, if there are a total of four Type I exits in the airplane and each exit with each slide installation is identical, a total of 20 deployment and inflation tests should be conducted, five on each exit. A lesser number of tests may be acceptable for a modification to the system installation or slide design. (Amendment 25-46)

(16) Paragraph (f)(1)(v). The packed escape slide as installed in the airplane, up to and including the hardware that attaches the slide to the door, should be subjected to the specified inertia forces. Each escape slide used in the test program should be subjected to the inertia forces but need not be subjected to the inertia forces more than once, even though it may be tested more than once. (Amendment 25-46)

(17) Paragraphs (f)(1)(iv) and (v). For wind or repeatability tests, as many deployments as possible should be done on an airplane. When using a mockup (also known as a module) for these tests, the following items, as a minimum, should be satisfactorily addressed: (Amendment 25-46)

(i) The door on the mockup should be a full-size door built as close to a production door as possible, using production hardware or prototype equivalents. This is especially critical with respect to the girt bar, floor fittings, pack board, bustle, the door motion, door velocity throughout the range of travel, and the way the slide drops. (Amendment 25-46)

(ii) The fuselage contour and skin surface of the mockup which might be contacted by the slide, under normal or adverse attitude or wind conditions, should be the same as the airplane contour. Additionally, fuselage protuberances such as pitot-static tubes and outflow valves should be accurately represented. (Amendment 25-46)

(iii) The impingement of the wind on the slide should be shown by aerodynamic analysis to be equal or greater than that on the airplane. (Amendment 25-46)

(18) Paragraph (f)(2). Large transport airplanes typically have heights from cockpit windows and/or floor level exits to the ground that may preclude the use of ropes as an acceptable assist means for egress. Demonstrations have shown that typical occupants do not have the upper body strength and/or stamina to descend a rope over longer distances without unacceptable slipping and/or falling. Consequently, alternative means, such as inertia reels or slides should be utilized, as appropriate. (Amendment 25-0)

(19) Paragraph (f)(2). Usability of the rope should be demonstrated by a 5<sup>th</sup> percentile female (approximately 60-inches tall and weighing no more than 102 lbs.) as well as a 95<sup>th</sup> percentile male (approximately 74-inches tall and weighing no less than 210 lbs.). (Amendment 25-0)

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(20) Paragraph (h). The guidance stated in paragraph 354b (13) of this AC applies to this amendment except paragraph 354b(13)(iv), as applied here, should read: "*The flap setting should be the highest takeoff or landing setting allowed in the AFM.*" (Amendment 25-32)

(21) Paragraph (h). The six feet above the ground may be measured as follows: (Amendment 25-15)

(i) At the lowest point along the required escape route, (Amendment 25-15)

(ii) When the airplane is on level ground, (Amendment 25-15)

(iii) The gross weight and center of gravity (c.g.) location should be considered for a typical takeoff configuration for the critical flap setting, (Amendment 25-15)

(iv) The flap setting should be the highest landing setting allowed in the AFM, (Amendment 25-15)

(v) The landing gear oleo setting, tire pressure and any other rigging dependent tolerances should be at their individual average values, and (Amendment 25-15)

(vi) The landing gear strut and tire compression should be based on the gross weight and c.g. location used in paragraph (20)(iii) above. (Amendment 25-15)

359. AMENDMENT 25-72, Effective August 20, 1990.

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/4550B95858A8478F8525667200519B39.0001>

b. Guidance.

(1) Paragraph (b). Other approved exits should be usable for rescue personnel to assist incapacitated flight crewmembers. If a cockpit flightcrew exit is not openable from the outside on the left side, another approved exit that is openable from the outside should be on the left side. The same applies to the right side. Also refer to § 25.807(f). The evaluation that an exit is openable from both inside and outside of the airplane, the adjacent seats must be positioned in the most adverse position of the seat including seat translation, seat rotation, seat back recline, seat back breakover, and seat tracking. (Amendment 25-0)

(2) Paragraph (b). Some airplanes initially certificated as passenger configurations may include cockpit windows that are openable only from the inside. On those airplanes, convenient and readily accessible passenger exits on both sides of the fuselage, that are openable from both the inside and outside, have been approved to comply with this requirement. When these airplanes are reconfigured as cargo-only airplanes, with an accompanying proposal to deactivate one of these passenger doors, provision must be made for continued compliance with this

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requirement (e.g., reconfiguring the cockpit window on that side so that it is openable from the outside). (Amendment 25-0)

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(3) Paragraph (b). The requirement that each emergency exit be openable from the inside and outside does not apply when the airplane is parked and unoccupied. It is acceptable to have locks that prevent unauthorized entry provided there are also satisfactory means to ensure that the locks are disengaged prior to passenger boarding. Such satisfactory means will vary depending on the size and complexity of the airplane. Cockpit annunciator lights are not necessary unless the emergency exits are so remotely located or numerous that lock disengagement might be overlooked. A lock pin with a red flag in an exit is satisfactory. The AFM should include a preflight checklist in the Procedures Section requiring the lock pin removal. (Amendment 25-0)

(4) Paragraphs (b)(1).

(i) All combinations of landing gear collapse must be considered.

(ii) Conditions analyzed will typically involve three ground contact points (e.g., nose gear, main gear, forward fuselage, wing box, aft fuselage, engine wing).

(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

(iv) Conditions where the airplane CG is not within the triangle formed by the three contact points (in the plan view) may be excluded, since the airplane would not be in a stable condition.

(v) The landing gear oleo setting, tire pressure and other rigging-dependent tolerances should be at their individual average values.

(vi) The landing gear strut and tire compression should be based on the gross weight and CG location used above.

(vii) The landing gear ground contact points should consider the intersection of the landing gear post centerline with the static ground plane or the planar centroid of the centers of each tire contact area on the static ground plane, whichever is more appropriate for the landing gear design.

(viii) For passenger exits, the sill height is measured from the centerline of the door sill. For the flight crew exits, the measurement is taken from the lowest point of the exit opening in whichever condition is being analyzed. For over-wing emergency exits requiring an assist means per § 25.810(d), the wing height should be established and measured at a representative point considering the escape route on the wing and the design and integration of the associated assist means.

(ix) The deflections and/or deformations associated with the static ground contact forces may be considered. This includes adjustments to landing gear strut and tire compression due to any changes in the landing gear post loads, nacelle crush and engine strut deflections. The

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dynamic effects of a crash event do not need to be considered (e.g., fuselage crush beyond what would be expected in a static condition, loss of engine(s)).

(x) Airplane pitch and roll angles are measured relative to the ground plane.

(xi) For adverse attitude conditions where the height of the forward fuselage has increased compared to the normal attitude condition, it may be assumed that the nose gear remains attached but is off the ground. (Amendment 32)

(5) Paragraph (c). The exits should be openable when the fuselage is pressurized to the maximum allowed for takeoff and landing. Usually, this pressure is about 0.125 psi. If design features such as automatic bleed-off, would make this full pressure unlikely, the exits should be openable at whatever pressure can reasonably be expected after taxi, rejected takeoff (RTO), or minor crash landing. (Amendment 25-0)

(6) Paragraph (g). A hole in the fuselage, such as an exit, inevitably has stronger structure surrounding it and is an acceptable provision. Clearances to account for deflections such as the doors, structure, and hinges, are also provisions. A minor crash landing is one in which the ultimate inertia forces of § 25.561(b)(3) are experienced. (Amendment 25-0)

360. AMENDMENT 25-114, Effective June 2, 2004.

a. Regulation. This amendment upgraded the design standards for fuselage doors, hatches, and exits on transport category airplanes. It improved door integrity by providing design criteria that ensure doors remain secure under all circumstances that service experience has shown can happen. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/4FB24AA043234AE786256E9B0069AB91.001>.

b. Guidance. There is no new guidance for this amendment.

361. AMENDMENT 25-116, Effective November 26, 2004.

a. Regulation. This amendment upgraded the airworthiness standards for transport category airplanes relating to flight attendant assist spaces and handles, door hold-open features, outside viewing means, interior compartment doors, and portable oxygen equipment. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/08F9AAB6A60A496D86257BF2004EBFA8.001>

b. Guidance. There is no new guidance for this amendment.

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362. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.809(a) by removing the requirement to view likely areas of evacuee ground contact from inside the airplane with the exit closed. See <https://drs.faa.gov/browse> for the regulatory text.

b. Guidance. For paragraph (a) of this amendment, refer to EASA CS-25 Book 2, AMC 25.809(a) and AMC 25.809(a)(3) for an acceptable method of compliance. The remainder of the guidance for this section is unchanged from previous amendments.

363 – 370. [RESERVED]

### SECTION 25.810 EMERGENCY EGRESS ASSIST MEANS AND ESCAPE ROUTES

371. Section 25.810 Did Not Exist Prior to Amendment 25-72.

372. AMENDMENT 25-72, Effective August 20, 1990.

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/DB243B15B1F8E2368525667200519CE8.0001>

b. Guidance.

(1) Paragraph (a). Part 25 addresses requirements for crew and passenger occupants only. It did not envision, nor does it specifically address an increasingly common category of occupant approved (by exemption to part 25) for freighter airplanes: supernumeraries (reference § 121.583). Supernumeraries are typically employed in some fashion to facilitate the movement or care of cargo and passengers, generally receive some degree of training over and above that possessed by passengers. Additionally, relatively few of them are accommodated onboard any airplane. Consequently, the terms of each exemption approving the carriage of supernumeraries are tailored to the installations and training involved. But in general, the FAA has conservatively considered supernumeraries to be more like passengers than crew and encourages and expects supernumeraries to be afforded the same overall level of safety as for passengers, to the maximum extent practicable—except that, for supernumeraries, more consideration is permitted for training and other special circumstances to achieve the requisite level of safety. For example, escape slides have typically been retained on freighter conversions. But in some limited special instances, inertial reels have been approved in lieu of slides. (Amendment 25-0)

(2) Paragraph (a)(1)(i) and (d). There should be a positive visual means of determining girt bar engagement to assure that the assisting means can be automatically deployed. (Amendment 25-15)

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(3) Paragraph (a)(1)(i) and (d). Passenger doors are those that can be expected to be used for normal passenger loading. Current airport terminal passenger loading facilities should be considered. An emergency exit qualifies as a service door if such as a galley or service bar is adjacent to the exit. An exit is not a service door if the galley is on the other side of the airplane with its own door. When the interior is used in more than one configuration, where the exit is a service door at times and solely an emergency exit at other times, the rule always allows fully automatic slides, or conversion from automatically inflated to manually inflated as the exit status varies. Since the second option may be impractical, the use of fully automatic slides always would be acceptable. The FAA considers that fully automatic slides may be hazardous to ground personnel and may find it acceptable to install a warning placard or red webbing stretched across the door window. A manual inflation handle with placarding is an acceptable different manner for slide erection. (Amendment 25-15)

(4) Paragraph (a)(1)(i). A passenger entrance door and service door are defined the same as that for passenger doors and service doors in paragraph 354b (9). (Amendment 25-32)

(5) Paragraph (a)(1)(ii) and (d). Collapse of any one or more landing gear legs will cause the slide angle to vary from the normal angle. At these various angles, it may be acceptable if the assisting means is safely usable by normal, healthy passengers. If this is not obvious by inspection, it should be demonstrated by test. The evacuation rate need not be the same as that with a normal angle. The adverse attitude also should be evaluated for the cockpit emergency egress provisions. (Amendment 25-15)

(6) Paragraph (a)(1)(iii) and (d). To be self-supporting, the bottom end of the slide should rest on the ground. If it does not rest on the ground, the slide must be usable and look usable to passengers. When the passenger uses the slide, the bottom end should rest on the ground and allow the passenger to egress, the slide readily. (Amendment 25-15)

(7) Paragraphs (a)(1)(iii) and (d).

(i) All combinations of landing gear collapse must be considered.

(ii) Conditions analyzed will typically involve three ground contact points (e.g., nose gear, main gear, forward fuselage, wing box, aft fuselage, engine wing).

(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

(iv) Conditions where the airplane CG is not within the triangle formed by the three contact points (in the plan view) may be excluded, since the airplane would not be in a stable condition.

(v) The landing gear oleo setting, tire pressure and other rigging dependent tolerances should be at their individual average values.

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(vi) The landing gear strut and tire compression should be based on the gross weight and CG location used above.

(vii) The landing gear ground contact points should consider the intersection of the landing gear post centerline with the static ground plane or the planar centroid of the centers of each tire contact area on the static ground plane, whichever is more appropriate for the landing gear design.

(viii) For passenger exits, the sill height is measure from the centerline of the door sill. For the flight crew exits, the measurement is taken from the lowest point on the exit opening in whichever condition is being analyzed. For over wing emergency exits requiring an assist means per § 25.810(d), the wing height should be established and measured at a representative point considering the escape route on the wing and the design and integration of the associated assist means.

(ix) The deflections and/or deformations associated with the static ground contact forces may be considered. This includes adjustments to landing gear strut and tire compression due to any changes in the landing gear post loads, nacelle crush and engine strut deflections. The dynamic effects of a crash event do not need to be considered (e.g., fuselage crush beyond what would be expected in a static condition, loss of engine(s)).

(x) Airplane pitch and roll angles are measure relative to the ground plane.

(xi) For adverse attitude conditions where the height of the forward fuselage has increased compared to the normal attitude condition, it may be assumed that the nose gear remains attached but is off the ground. (Amendment 32)

(8) Paragraph (a)(1)(iii), (iv) and (d). In order to meet the 25-knot wind requirement, the escape slide presses against the fuselage and the end of the unoccupied slide may not be in physical contact with the ground, especially in the most adverse attitude (gear collapse). This condition has been found to be acceptable provided the slide is self-supporting on the ground shortly after an evacuee has entered the slide and prior to the evacuee reaching the end of the slide. The unoccupied slide, when viewed from the exit, should not give the visual impression that the slide is unsafe for use. (Amendment 25-47)

(9) Paragraph (a)(1)(iv) and (d). (Amendment 25-46)

(i) The person who assists should come from the airplane. This capability should be demonstrated by test. (Amendment 25-46)

(ii) Escape slides that deploy in front of an engine inlet may need to be assessed for the effect of the inlet airflow on the acceptable deployment of the escape slide. Since the wind condition is assumed, the effect of the inlet airflow should be considered in combination with the 25-knot. wind. The effect of the engine is non-linear with respect to distance from the inlet, so that tests that do not use an actual running engine should contain conservative conditions or assumptions to ensure that the installation is acceptable. For example, adding the effect of the

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engine (at specific distance from the inlet) to the wind velocity, and then verifying that the slide will come no closer to the engine than that distance is an acceptable method. (Amendment 25- 46)

(10) Paragraphs (a)(1)(iv) and (d). For wind or repeatability tests, as many deployments as possible should be done on an airplane. When using a mockup (also known as a module) for these tests, the following items, as a minimum, should be satisfactorily addressed: (Amendment 25-46)

(i) The door on the mockup should be a full-size door built as close to a production door as possible, using production hardware or prototype equivalents. This is especially critical with respect to the girt bar, floor fittings, pack board, bustle, the door motion, door velocity throughout the range of travel, and the way the slide drops. (Amendment 25-46)

(ii) The fuselage contour and skin surface of the mockup which might be contacted by the slide, under any normal or adverse attitude or wind conditions, should be the same as the airplane contour. Additionally, fuselage protuberances such as pitot-static tubes and outflow valves should be accurately represented. (Amendment 25-46)

(iii) The impingement of the wind on the slide should be shown by aerodynamic analysis to be equal or greater than that on the airplane. (Amendment 25-46)

(11) Paragraph (a)(1)(v) and (d). The five tests should be conducted for each individual exit. For instance, if there are a total of four Type I exits in the airplane and each exit with each slide installation is identical, a total of 20 deployment and inflation tests should be conducted, five on each exit. A lesser number of tests may be acceptable for a modification to the system installation or slide design. (Amendment 25-46)

(12) Paragraph (a)(1)(v) and (d). The packed escape slide as installed in the airplane, up to and including the hardware that attaches the slide to the door, should be subjected to the specified inertia forces. Each escape slide used in the test program should be subjected to the inertia forces but need not be subjected to the inertia forces more than once, even though it may be tested more than once. (Amendment 25-46)

(13) Paragraph (a)(2). Large transport airplanes typically have heights from cockpit windows and/or floor level exits to the ground that may preclude the use of ropes as an acceptable assist means for egress. Demonstrations have shown that typical occupants do not have the upper body strength and/or stamina to descend a rope over longer distances without unacceptable slipping and/or falling. Consequently, alternative means, such as inertia reels or slides should be utilized, as appropriate. (Amendment 25-0)

(14) Paragraph (a)(2). Usability of the rope should be demonstrated by a 5<sup>th</sup> percentile female (approximately 60-inches tall and weighing no more than 102 lbs) as well as a 95<sup>th</sup> percentile male (approximately 74-inches tall and weighing no less than 210 lbs.). (Amendment 25-0)

(15) Paragraph (c). (Amendment 25-15)

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(i) Military Specifications Mil W-5044B and Mil-W-5044C, titled "Walkway Compound, Nonslip and Walkway Matting, Nonslip," measure dynamic coefficient of friction and provide an acceptable standard for the slip resistant properties when a minimum dynamic coefficient of friction of 0.45 is measured. This is an acceptable measure for this section and for § 25.793. (Amendment 25-15)

(ii) A 42-inch-wide escape path is acceptable for airplanes incorporating dual overwing Type III exits. (Amendment 25-15)

(16) Paragraph (d). The guidance stated in paragraph 354b (13) of this AC applies to this amendment except paragraph 354b(13)(iv), as applied here, should read: "*The flap setting should be the highest takeoff or landing setting allowed in the AFM.*" (Amendment 25-32)

(17) Paragraph (d). The six feet above the ground may be measured as follows: (Amendment 25-15)

(i) At the lowest point along the required escape route, (Amendment 25-15)

(ii) When the airplane is on level ground, (Amendment 25-15)

(iii) The gross weight and center of gravity (c.g.) location should be considered for a typical takeoff configuration for the critical flap setting, (Amendment 25-15)

(iv) The flap setting should be the highest landing setting allowed in the AFM, (Amendment 25-15)

(v) The landing gear oleo setting, tire pressure and any other rigging dependent tolerances should be at their individual average values, and (Amendment 25-15)

(vi) The landing gear strut and tire compression should be based on the gross weight and c.g. location used in paragraph (16)(iii) above. (Amendment 25-15)

373. AMENDMENT 25-88, Effective December 9, 1996.

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/AFCFE263BE6DD498852566720051AC52.000>

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b. Guidance.

(1) Paragraph (a). Part 25 addresses requirements for crew and passenger occupants only. It did not envision, nor does it specifically address an increasingly common category of occupant approved (by exemption to part 25) for freighter airplanes: supernumeraries (reference § 121.583). Supernumeraries are typically employed in some fashion to facilitate the movement or care of cargo and passengers, generally receive some degree of training over and above that possessed by passengers. Additionally, relatively few of them are accommodated onboard any

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airplane. Consequently, the terms of each exemption approving the carriage of supernumeraries are tailored to the installations and training involved. But in general, the FAA has conservatively considered supernumeraries to be more like passengers than crew and encourages and expects supernumeraries to be afforded the same overall level of safety as for passengers, to the maximum extent practicable—except that, for supernumeraries, more consideration is permitted for training and other special circumstances to achieve the requisite level of safety. For example, escape slides have typically been retained on freighter conversions. But in some limited special instances, inertial reels have been approved in lieu of slides. (Amendment 25-0)

(2) Paragraph (a)(1)(i) and (d). There should be a positive visual means of determining girt bar engagement to assure that the assisting means can be automatically deployed. (Amendment 25-15)

(3) Paragraph (a)(1)(i) and (d). Passenger doors are those that can be expected to be used for normal passenger loading. Current airport terminal passenger loading facilities should be considered. An emergency exit qualifies as a service door if such as a galley or service bar is adjacent to the exit. An exit is not a service door if the galley is on the other side of the airplane with its own door. When the interior is used in more than one configuration, where the exit is a service door at times and solely an emergency exit at other times, the rule always allows fully automatic slides, or conversion from automatically inflated to manually inflated as the exit status varies. Since the second option may be impractical, the use of fully automatic slides always would be acceptable. The FAA considers that fully automatic slides may be hazardous to ground personnel and may find it acceptable to install a warning placard or red webbing stretched across the door window. A manual inflation handle with placarding is an acceptable different manner for slide erection. (Amendment 25-15)

(4) Paragraph (a)(1)(i). A passenger entrance door and service door are defined the same as that for passenger doors and service doors in paragraph 354b (9). (Amendment 25-32)

(5) Paragraph (a)(1)(ii) and (d)(2). Collapse of any one or more landing gear legs will cause the slide angle to vary from the normal angle. At these various angles, it may be acceptable if the assisting means is safely usable by normal, healthy passengers. If this is not obvious by inspection, it should be demonstrated by test. The evacuation rate need not be the same as that with a normal angle. The adverse attitude also should be evaluated for the cockpit emergency egress provisions. (Amendment 25-15)

(6) Paragraph (a)(1)(iii) and (d)(2). To be self-supporting, the bottom end of the slide should rest on the ground. If it does not rest on the ground, the slide must be usable and look usable to passengers. When the passenger uses the slide, the bottom end should rest on the ground and allow the passenger to egress, the slide readily. (Amendment 25-15)

(7) Paragraphs (a)(1)(iii) and (d)(2).

(i) All combinations of landing gear collapse must be considered.

(ii) Conditions analyzed will typically involve three ground contact points (e.g., nose gear, main gear, forward fuselage, wing box, aft fuselage, engine wing).

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(iii) The gross weight and center of gravity (CG) location should be considered for typical takeoff and landing configurations.

(iv) Conditions where the airplane CG is not within the triangle formed by the three contact points (in the plan view) may be excluded, since the airplane would not be in a stable condition.

(v) The landing gear oleo setting, tire pressure and other rigging-dependent tolerances should be at their individual average values.

(vi) The landing gear strut and tire compression should be based on the gross weight and CG location used above.

(vii) The landing gear ground contact points should consider the intersection of the landing gear post centerline with the static ground plane or the planar centroid of the centers of each tire contact area on the static ground plane, whichever is more appropriate for the landing gear design.

(viii) For passenger exits, the sill height is measured from the centerline of the door sill. For the flight crew exits, the measurement is taken from the lowest point of the exit opening in whichever condition is being analyzed. For over-wing emergency exits requiring an assist means per § 25.810(d), the wing height should be established and measured at a representative point considering the escape route on the wing and the design and integration of the associated assist means.

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(x) Airplane pitch and roll angles are measured relative to the ground plane.

(xi) For adverse attitude conditions where the height of the forward fuselage has increased compared to the normal attitude condition, it may be assumed that the nose gear remains attached but is off the ground. (Amendment 32)

(8) Paragraph (a)(1)(iii), (iv) and (d)(2). To meet the 25-knot wind requirement, the escape slide presses against the fuselage and the end of the unoccupied slide may not be in physical contact with the ground, especially in the most adverse attitude (gear collapse). This condition has been found to be acceptable provided the slide is self-supporting on the ground shortly after an evacuee has entered the slide and prior to the evacuee reaching the end of the slide. The unoccupied slide, when viewed from the exit, should not give the visual impression that the slide is unsafe for use. (Amendment 25-47)

(9) Paragraph (a)(1)(iv) and (d)(2). (Amendment 25-46)

(i) The person who assists should come from the airplane. This capability should be demonstrated by test. (Amendment 25-46)

(ii) Escape slides that deploy in front of an engine inlet may need to be assessed for the effect of the inlet airflow on the acceptable deployment of the escape slide. Since the wind condition is assumed, the effect of the inlet airflow should be considered in combination with the 25-knot. wind. The effect of the engine is non-linear with respect to distance from the inlet, so that tests that do not use an actual running engine should contain conservative conditions or assumptions to ensure that the installation is acceptable. For example, adding the effect of the engine (at specific distance from the inlet) to the wind velocity, and then verifying that the slide will come no closer to the engine than that distance is an acceptable method. (Amendment 25-46)

(10) Paragraphs (a)(1)(iv) and (d). For wind or repeatability tests, as many deployments as possible should be done on an airplane. When using a mockup (also known as a module) for these tests, the following items, as a minimum, should be satisfactorily addressed: (Amendment 25-46)

(i) The door on the mockup should be a full-size door built as close to a production door as possible, using production hardware or prototype equivalents. This is especially critical with respect to the girt bar, floor fittings, pack board, bustle, the door motion, door velocity throughout the range of travel, and the way the slide drops. (Amendment 25-46)

(ii) The fuselage contour and skin surface of the mockup which might be contacted by the slide, under any normal or adverse attitude or wind conditions, should be the same as the airplane contour. Additionally, fuselage protuberances such as pitot-static tubes and outflow valves should be accurately represented. (Amendment 25-46)

(iii) The impingement of the wind on the slide should be shown by aerodynamic analysis to be equal or greater than that on the airplane. (Amendment 25-46)

(11) Paragraph (a)(1)(v) and (d). The five tests should be conducted for each individual exit. For instance, if there are a total of four Type I exits in the airplane and each exit with each slide installation is identical, a total of 20 deployment and inflation tests should be conducted, five on each exit. A lesser number of tests may be acceptable for a modification to the system installation or slide design. (Amendment 25-46)

(12) Paragraph (a)(1)(v) and (d). The packed escape slide as installed in the airplane, up to and including the hardware that attaches the slide to the door, should be subjected to the specified inertia forces. Each escape slide used in the test program should be subjected to the inertia forces but need not be subjected to the inertia forces more than once, even though it may be tested more than once. (Amendment 25-46)

(13) Paragraph (a)(2). Large transport airplanes typically have heights from cockpit windows and/or floor level exits to the ground that may preclude the use of ropes as an acceptable assist means for egress. Demonstrations have shown that typical occupants do not have the upper body strength and/or stamina to descend a rope over longer distances without unacceptable slipping and/or falling. Consequently, alternative means, such as inertia reels or slides should be utilized, as appropriate. (Amendment 25-0)

(14) Paragraph (a)(2). Usability of the rope should be demonstrated by a 5<sup>th</sup> percentile female (approximately 60-inches tall and weighing no more than 102 lbs) as well as a 95<sup>th</sup> percentile male (approximately 74-inches tall and weighing no less than 210 lbs.). (Amendment 25-0)

(15) Paragraph (c). (Amendment 25-15)

(i) Military Specifications Mil W-5044B and Mil-W-5044C, titled "Walkway Compound, Nonslip and Walkway Matting, Nonslip," measure dynamic coefficient of friction and provide an acceptable standard for the slip resistant properties when a minimum dynamic coefficient of friction of 0.45 is measured. This is an acceptable measure for this section and for § 25.793. (Amendment 25-15)

(ii) A 42-inch-wide escape path is acceptable for airplanes incorporating dual overwing Type III exits. (Amendment 25-15)

(16) Paragraph (c). The guidance stated in paragraph 354b (13) of this AC applies to this amendment except paragraph 354b(13)(iv), as applied here, should read: "The flap setting should be the highest takeoff or landing setting allowed in the AFM." (Amendment 25-32)

(17) Paragraph (c). The six feet above the ground may be measured as follows: (Amendment 25-15)

(i) At the lowest point along the required escape route, (Amendment 25-15)

(ii) When the airplane is on level ground, (Amendment 25-15)

(iii) The gross weight and center of gravity (c.g.) location should be considered for a typical takeoff configuration for the critical flap setting, (Amendment 25-15)

(iv) The flap setting should be the highest landing setting allowed in the AFM, (Amendment 25-15)

(v) The landing gear oleo setting, tire pressure and any other rigging dependent tolerances should be at their individual average values, and (Amendment 25-15)

(vi) The landing gear strut and tire compression should be based on the gross weight and c.g. location used in paragraph (16)(iii) above. (Amendment 25-15)

## Draft for Public Comment

374. AMENDMENT 25-114, Effective April 20, 2004.

a. Regulation. This amendment revises § 25.810 by adding a new paragraph (e) to read as follows:

\* \* \* \*

(e) If an integral stair is installed in a passenger entry door that is qualified as a passenger emergency exit, the stair must be designed so that, under the following conditions, the effectiveness of passenger emergency egress will not be impaired:

(1) The door, integral stair, and operating mechanism have been subjected to the inertia forces specified in § 25.561(b)(3), acting separately relative to the surrounding structure.

(2) The airplane is in the normal ground attitude and in each of the attitudes corresponding to collapse of one or more legs of the landing gear.

b. Guidance. There is no new guidance for this amendment.

375. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.810(a)(1)(ii) to provide an option allowing 10 seconds to automatically erect assisting means from the time the opening means of the exit is actuated for non-Type C exits. See <https://drs.faa.gov/browse> for the regulatory text.

b. Guidance. For paragraph (a) of this amendment, refer to EASA CS-25 Book 2, AMC 25.810 for an acceptable method of compliance.

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# Draft for Public Comment

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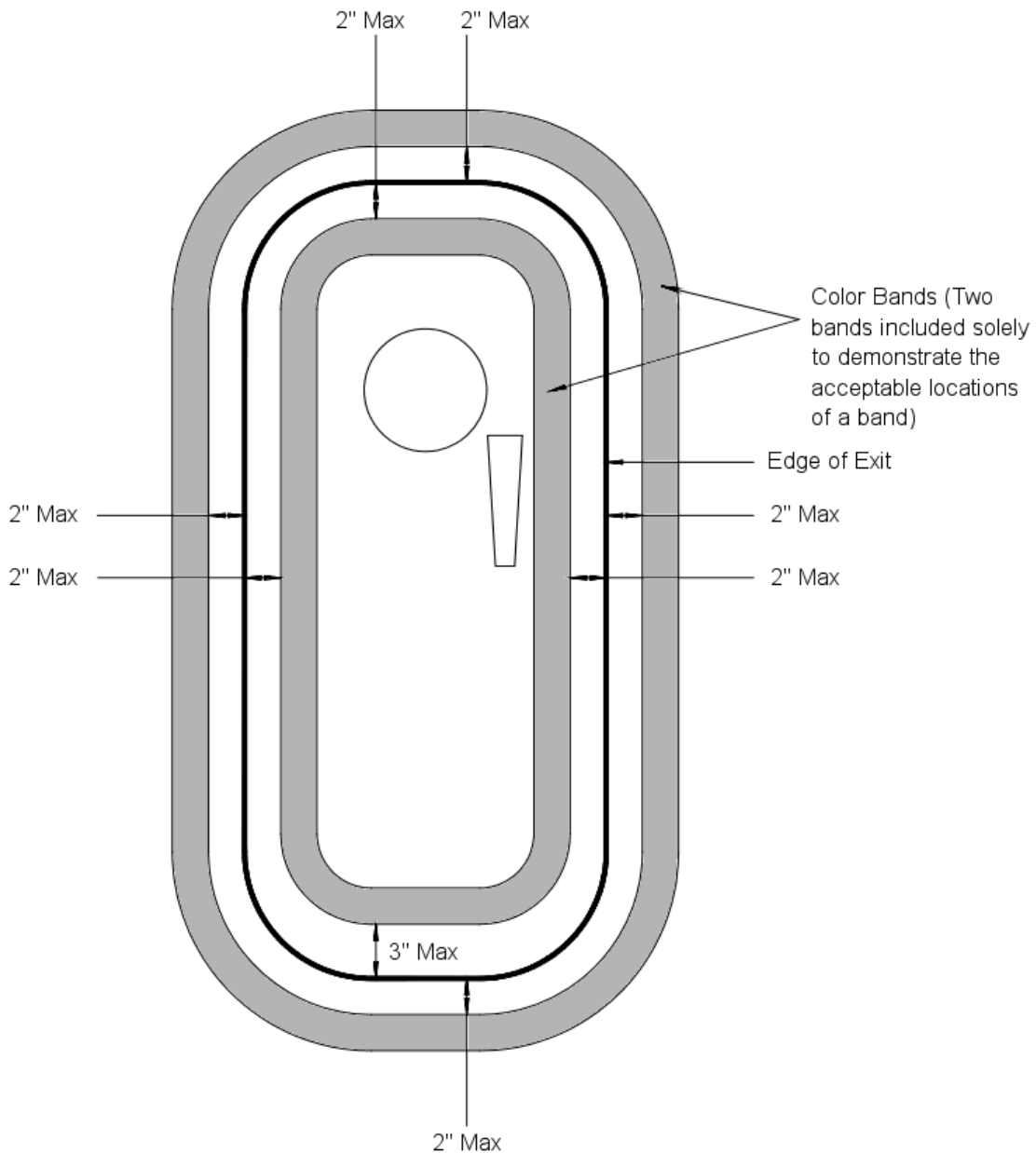
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side sections of a band located a maximum of 2-inches away from the exit's edge and the bottom section of a band located between 2-inches below and 3-inches above the exit's edge.

Figure 385-1 is a figure that demonstrates these boundaries. The bottom section of the band is allowed to be farther away from the exit's edge than the other sides of the band to be consistent with past practices for exits with a door sill installed at their base. Although the band is not required to be on the edge of the exit, it must be parallel to the exit's edge in order to outline the exit as required by the rule. (Amendment 25-1)

**FIGURE 385-1 ACCEPTABLE COLOR BAND LOCATIONS FOR AN EXIT THE SIZE OF A TYPE II EXIT OR LARGER**



386. AMENDMENT 25-79, Effective September 27, 1993.a. Regulation.

*(a) Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked.*

*(b) The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin.*

*(c) Means must be provided to assist the occupants in locating the exits in conditions of dense smoke.*

*(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—*

*(1) A passenger emergency exit locator sign above the aisle (or aisles) near each passenger emergency exit, or at another overhead location if it is more practical because of low headroom, except that one sign may serve more than one exit if each exit can be seen readily from the sign;*

*(2) A passenger emergency exit marking sign next to each passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from the sign; and*

*(3) A sign on each bulkhead or divider that prevents fore and aft vision along the passenger cabin to indicate emergency exits beyond and obscured by the bulkhead or divider, except that if this is not possible the sign may be placed at another appropriate location.*

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

*(1) Each passenger emergency exit must have, on or near the exit, a marking that is readable from a distance of 30-inches.*

*[(2) Each passenger emergency exit operating handle and the cover removal instructions, if the operating handle is covered, must—]*

*(i) Be self-illuminated with an initial brightness of at least 160 microlamberts; or*

*(ii) Be conspicuously located and well illuminated by the emergency lighting even in conditions of occupant crowding at the exit.*

*[(3) [Reserved.]*

(4) *Each Type A, Type I, and Type II passenger emergency exit with a locking mechanism released by rotary motion of the handle must be marked—*

(i) *With a red arrow, with a shaft at least three-fourths of an-inch wide and a head twice the width of the shaft, extending along at least 70 degrees of arc at a radius approximately equal to three-fourths of the handle length.*

(ii) *So that the centerline of the exit handle is within  $\pm 1$ -inch of the projected point of the arrow when the handle has reached full travel and has released the locking mechanism, and*

(iii) *With the word “open” in red letters 1-inch high, placed horizontally near the head of the arrow.*

(f) *Each emergency exit that is required to be openable from the outside, and its means of opening, must be marked on the outside of the airplane. In addition, the following apply:*

(1) *The outside marking for each passenger emergency exit in the side of the fuselage must include a 2-inch colored band outlining the exit.*

(2) *Each outside marking including the band, must have color contrast to be readily distinguishable from the surrounding fuselage surface. The contrast must be such that if the reflectance of the darker color is 15 percent or less, the reflectance of the lighter color must be at least 45 percent. "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives. When the reflectance of the darker color is greater than 15 percent, at least a 30-percent difference between its reflectance and the reflectance of the lighter color must be provided.*

(3) *In the case of exits other than those in the side of the fuselage, such as ventral or tail cone exits, the external means of opening, including instructions if applicable, must be conspicuously marked in red, or bright chrome yellow if the background color is such that red is inconspicuous. When the opening means is located on only one side of the fuselage, a conspicuous marking to that effect must be provided on the other side.*

(g) *Each sign required by paragraph (d) of this section may use the word "exit" in its legend in place of the term "emergency exit."*

b. Guidance.

(1) Paragraphs (a) and (e). Exit identity and conspicuity of operating instructions should be readable by a person with 20/20 vision making a normal effort under representative day and emergency night lighting. (Amendment 25-0)

(2) Paragraph (c). The intent of this requirement is to require additional hardware means to materially enhance occupant's ability to locate the exits. Compliance with the floor proximity emergency escape path marking requirements of § 25.812(e) is also considered compliance with the requirements of this section. (Amendment 25-15)

(3) Paragraph (d). The signs required by paragraphs (d)(1), (2), and (3) are intended to be independent and serve different functions. However, certain cabin arrangements might permit a single sign to serve the functions of both paragraphs (d)(1) and (3). If such an arrangement were presented, the sign should meet the contrast and brightness requirements of § 25.812(b)(1)(i) and should be in close proximity to the exits concerned. Compliance with both §§ 25.811(d)(1) and (3) is required regardless of the number of signs employed. (Amendment 25-32)

(4) Paragraph (d). Similar to the guidance immediately above, certain cabin arrangements and especially small cabin sizes might permit a single sign to serve both the locator and marker sign functions of paragraphs (d)(1) and (d)(2). If such a proposal was presented, the proposal should address all pertinent requirements of § 25.812, and it should be demonstrated that the sign satisfactorily performs both marker and locator sign functions. (Amendment 25-32)

(5) Paragraph (d)(2). Prior to Amendment 25-32, the exit marking sign of § 25.811(d)(2) was referred to as a locator sign in § 25.811(d)(2) for floor level exits. The locator sign requirement of § 25.811(d)(1) for floor level exits was introduced by Amendment 25-32. (Amendment 25-32)

(6) Paragraph (d). The signs required by paragraphs (d)(1) and (3) should be removed from the passenger compartment in mixed passenger/cargo arrangements if they indicate exits in the cargo compartment which are not accessible to passengers. For exits inaccessible in the cargo portion of the fuselage, the signs installed by this paragraph for passenger configurations may be left installed if they are not visible to the passengers. (Amendment 25-1)

(7) Paragraph (d)(2). The requirement for a sign next to each floor level exit is not satisfied by a sign mounted on the exit. The sign should remain visible whether or not the exit is open. In the case of an exit-mounted sign, the sign is removed when the exit is opened. This arrangement should not be employed. (Amendment 25-1)

(8) Paragraph (e). An exit opening handle where motion is in the plane perpendicular to the exit is not considered a rotary handle as defined in this paragraph. Therefore, the marking arrow specified is not required by this regulation. However, in order to provide an equivalent level of safety for this type of handle motion, markings appropriate to this type of handle should be provided. This should be documented in an Equivalent Safety Finding Issue Paper. (Amendment 25-1)

(9) Paragraph (f). Exit bands are not required for "flightcrew only" exits or other emergency exits not in the sides of the fuselage. (Amendment 25-15)

(10) Paragraph (h). (Amendment 25-1)

(i) Guidance material for exterior colored bands around exits is provided in AC 20-47, “Exterior Colored Band Around Exits on Transport Airplanes,” dated 2/8/66. (Amendment 25-1)

(ii) For airplanes that are convertible from passenger to mixed passenger/cargo arrangements, the exits unusable due to cargo blockage should be so marked. This can be indicated by a placard on or adjacent to the exit. The placard should provide obvious indication from the ground, to a rescue crew that the exit is not operable. No other change to the external markings is required. (Amendment 25-1)

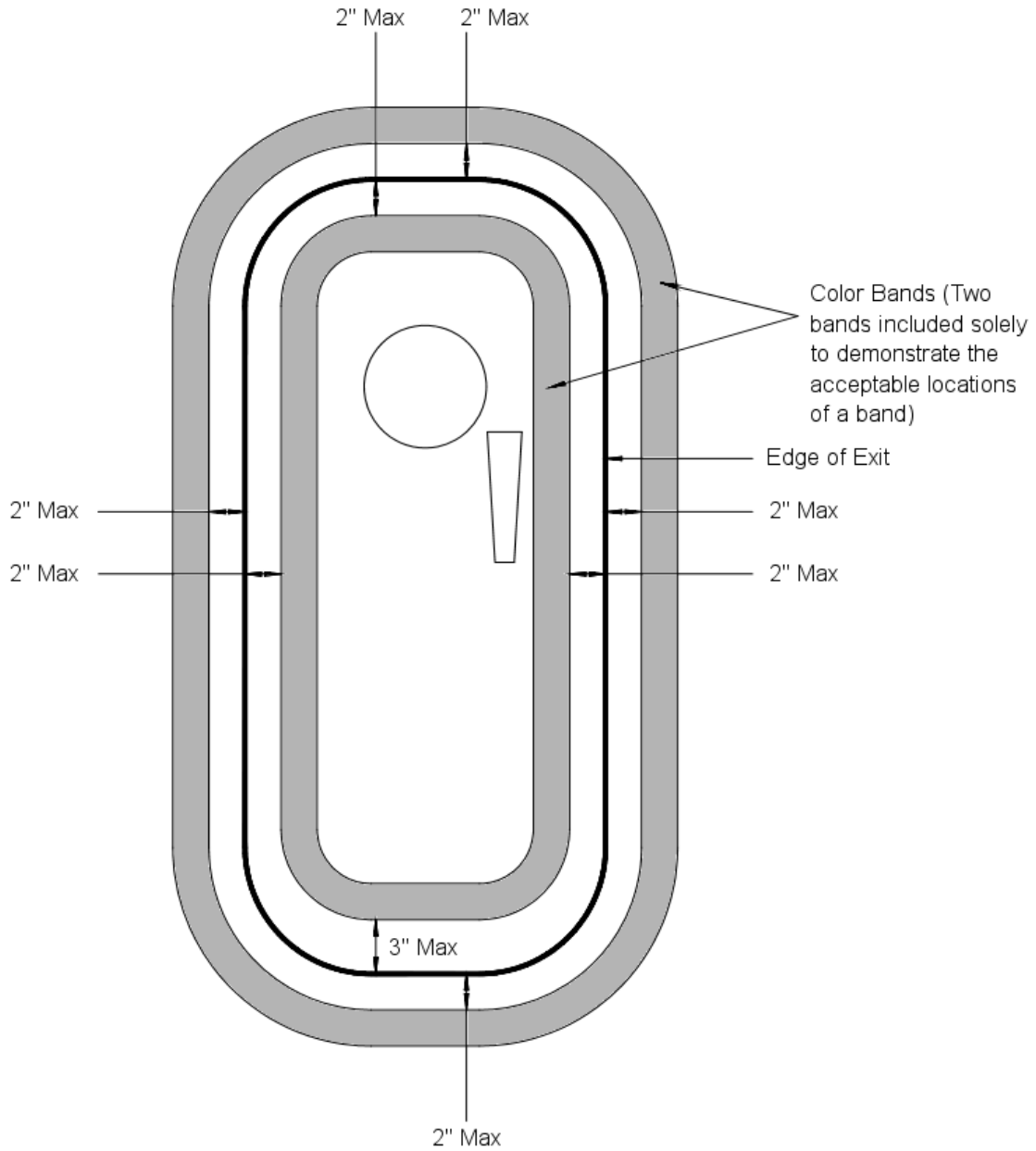
(iii) If exits are deactivated, refer to § 25.807, Amendment 25-15, for guidance regarding deletion of markings for deactivated exits. (Amendment 25-1)

(11) Paragraphs (f)(1) and (2). The FAA issued policy memorandum ANM-03-115-04, dated April 2, 2003, and titled “Policy Statement on Exit Bands.” The policy is applicable to Amendment 25-79 for §§ 25.811(f)(1) and (2) as follows: (Amendment 25-1)

(i) The FAA has been asked if compliance with §§ 25.811(f)(1) and (2) can be found with the lower section of a two-inch colored band located a few-inches above the base of an exit. Metal door sills are often installed on the fuselage below floor-level exits to provide protection from impacts with loading equipment. If the band is located on the bottom edge of an exit, its color must be compared with the door sill color to determine compliance with § 25.811(f)(2). This requirement can result in a color scheme which is not desired by the operator. Note that painting the door sill is not considered a viable option since impacts with loading equipment cause the paint to scratch and wear away quickly. If the band is located a few-inches above the base of the exit, its color is compared with the door color below the band instead of the metal door sill. This results in more color options for operators to choose from in determining a desired color scheme. (Amendment 25-1)

(ii) The purpose of these bands is to assist rescue personnel in recognizing exits in the side of the fuselage. Section 25.811(f)(1) requires that a two-inch color band outline each passenger emergency exit in the side of the fuselage. Advisory Circular 20-47, paragraph 4b, indicates that a color band outlining an exit is considered to comply with applicable regulations whether the band is on the edge of the exit itself, on the fuselage surrounding the exit, or partially on both. Although this guidance indicates acceptance of bands located on the edge of the exit itself, the FAA considers that a band could be located a small distance away from the exit’s edge and still be considered to “outline” the exit as required by § 25.811(f)(1). The FAA finds that for floor-level exits the size of a Type II exit or larger, compliance can be found with the top and side sections of a band located a maximum of 2-inches away from the exit’s edge and the bottom section of a band located between 2-inches below and 3-inches above the exit’s edge. Figure 386-1 is a figure that demonstrates these boundaries. The bottom section of the band is allowed to be farther away from the exit’s edge than the other sides of the band to be consistent with past practices for exits with a door sill installed at their base. Although the band is not required to be on the edge of the exit, it must be parallel to the exit’s edge in order to outline the exit as required by the rule. (Amendment 25-1)

**FIGURE 386-1 ACCEPTABLE COLOR BAND LOCATIONS FOR AN EXIT THE SIZE OF A TYPE II EXIT OR LARGER**



387. AMENDMENT 25-88, Effective December 9, 1996.a. Regulation.

*(a) Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked.*

*(b) The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin.*

*(c) Means must be provided to assist the occupants in locating the exits in conditions of dense smoke.*

*(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—*

*(1) A passenger emergency exit locator sign above the aisle (or aisles) near each passenger emergency exit, or at another overhead location if it is more practical because of low headroom, except that one sign may serve more than one exit if each exit can be seen readily from the sign;*

*(2) A passenger emergency exit marking sign next to each passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from the sign; and*

*(3) A sign on each bulkhead or divider that prevents fore and aft vision along the passenger cabin to indicate emergency exits beyond and obscured by the bulkhead or divider, except that if this is not possible the sign may be placed at another appropriate location.*

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

*(1) Each passenger emergency exit must have, on or near the exit, a marking that is readable from a distance of 30-inches.*

*[(2) Each Type A, Type B, Type C or Type I passenger emergency exit operating handle must—]*

*(i) Be self-illuminated with an initial brightness of at least 160 microlamberts; or*

*(ii) Be conspicuously located and well illuminated by the emergency lighting even in conditions of occupant crowding at the exit.*

*(3) Reserved.*

*[(4) Each Type A, Type B, Type C, Type I, or Type II passenger emergency exit with a locking mechanism released by rotary motion of the handle must be marked—]*

*(i) With a red arrow, with a shaft at least three-fourths of an-inch wide and a head twice the width of the shaft, extending along at least 70 degrees of arc at a radius approximately equal to three-fourths of the handle length.*

*(ii) So that the centerline of the exit handle is within  $\pm 1$ -inch of the projected point of the arrow when the handle has reached full travel and has released the locking mechanism, and*

*(iii) With the word "open" in red letters 1-inch high, placed horizontally near the head of the arrow.*

*(f) Each emergency exit that is required to be openable from the outside, and its means of opening, must be marked on the outside of the airplane. In addition, the following apply:*

*(1) The outside marking for each passenger emergency exit in the side of the fuselage must include a 2-inch colored band outlining the exit.*

*(2) Each outside marking including the band, must have color contrast to be readily distinguishable from the surrounding fuselage surface. The contrast must be such that if the reflectance of the darker color is 15 percent or less, the reflectance of the lighter color must be at least 45 percent. "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives. When the reflectance of the darker color is greater than 15 percent, at least a 30-percent difference between its reflectance and the reflectance of the lighter color must be provided.*

*(3) In the case of exits other than those in the side of the fuselage, such as ventral or tailcone exits, the external means of opening, including instructions if applicable, must be conspicuously marked in red, or bright chrome yellow if the background color is such that red is inconspicuous. When the opening means is located on only one side of the fuselage, a conspicuous marking to that effect must be provided on the other side.*

*(g) Each sign required by paragraph (d) of this section may use the word "exit" in its legend in place of the term "emergency exit."*

b. Guidance.

(1) Paragraphs (a) and (e). Exit identity and conspicuity of operating instructions should be readable by a person with 20/20 vision making a normal effort under representative day and emergency night lighting. (Amendment 25-0)

(2) Paragraph (c). The intent of this requirement is to require additional hardware means to materially enhance occupant's ability to locate the exits. Compliance with the floor proximity emergency escape path marking requirements of § 25.812(e) is also considered compliance with the requirements of this section. (Amendment 25-15)

(3) Paragraph (d). The signs required by paragraphs (d)(1), (2), and (3) are intended to be independent and serve different functions. However, certain cabin arrangements might permit a single sign to serve the functions of both paragraphs (d)(1) and (3). If such an arrangement were presented, the sign should meet the contrast and brightness requirements of § 25.812(b)(1)(i) and should be in close proximity to the exits concerned. Compliance with both §§ 25.811(d)(1) and (3) is required regardless of the number of signs employed. (Amendment 25-32)

(4) Paragraph (d). Similar to the guidance immediately above, certain cabin arrangements and especially small cabin sizes might permit a single sign to serve both the locator and marker sign functions of paragraphs (d)(1) and (d)(2). If such a proposal was presented, the proposal should address all pertinent requirements of § 25.812, and it should be demonstrated that the sign satisfactorily performs both marker and locator sign functions. (Amendment 25-32)

(5) Paragraph (d)(2). Prior to Amendment 25-32, the exit marking sign of § 25.811(d)(2) was referred to as a locator sign in § 25.811(d)(2) for floor level exits. The locator sign requirement of § 25.811(d)(1) for floor level exits was introduced by Amendment 25-32. (Amendment 25-32)

(6) Paragraph (d). The signs required by paragraphs (d)(1) and (3) should be removed from the passenger compartment in mixed passenger/cargo arrangements if they indicate exits in the cargo compartment which are not accessible to passengers. For exits inaccessible in the cargo portion of the fuselage, the signs installed by this paragraph for passenger configurations may be left installed if they are not visible to the passengers. (Amendment 25-1)

(7) Paragraph (d)(2). The requirement for a sign next to each floor level exit is not satisfied by a sign mounted on the exit. The sign should remain visible whether or not the exit is open. In the case of an exit-mounted sign, the sign is removed when the exit is opened. This arrangement should not be employed. (Amendment 25-1)

(8) Paragraph (e). An exit opening handle where motion is in the plane perpendicular to the exit is not considered a rotary handle as defined in this paragraph. Therefore, the marking arrow specified is not required by this regulation. However, in order to provide an equivalent level of safety for this type of handle motion, markings appropriate to this type of handle should be provided. This should be documented in an Equivalent Safety Finding Issue Paper. (Amendment 25-1)

(9) Paragraph (f). Exit bands are not required for "flightcrew only" exits or other emergency exits not in the sides of the fuselage. (Amendment 25-15)

(10) Paragraph (h). (Amendment 25-1)

(i) Guidance material for exterior colored bands around exits is provided in AC 20-47, “Exterior Colored Band Around Exits on Transport Airplanes,” dated 2/8/66. (Amendment 25-1)

(ii) For airplanes that are convertible from passenger to mixed passenger/cargo arrangements, the exits unusable due to cargo blockage should be so marked. This can be indicated by a placard on or adjacent to the exit. The placard should provide obvious indication from the ground, to a rescue crew that the exit is not operable. No other change to the external markings is required. (Amendment 25-1)

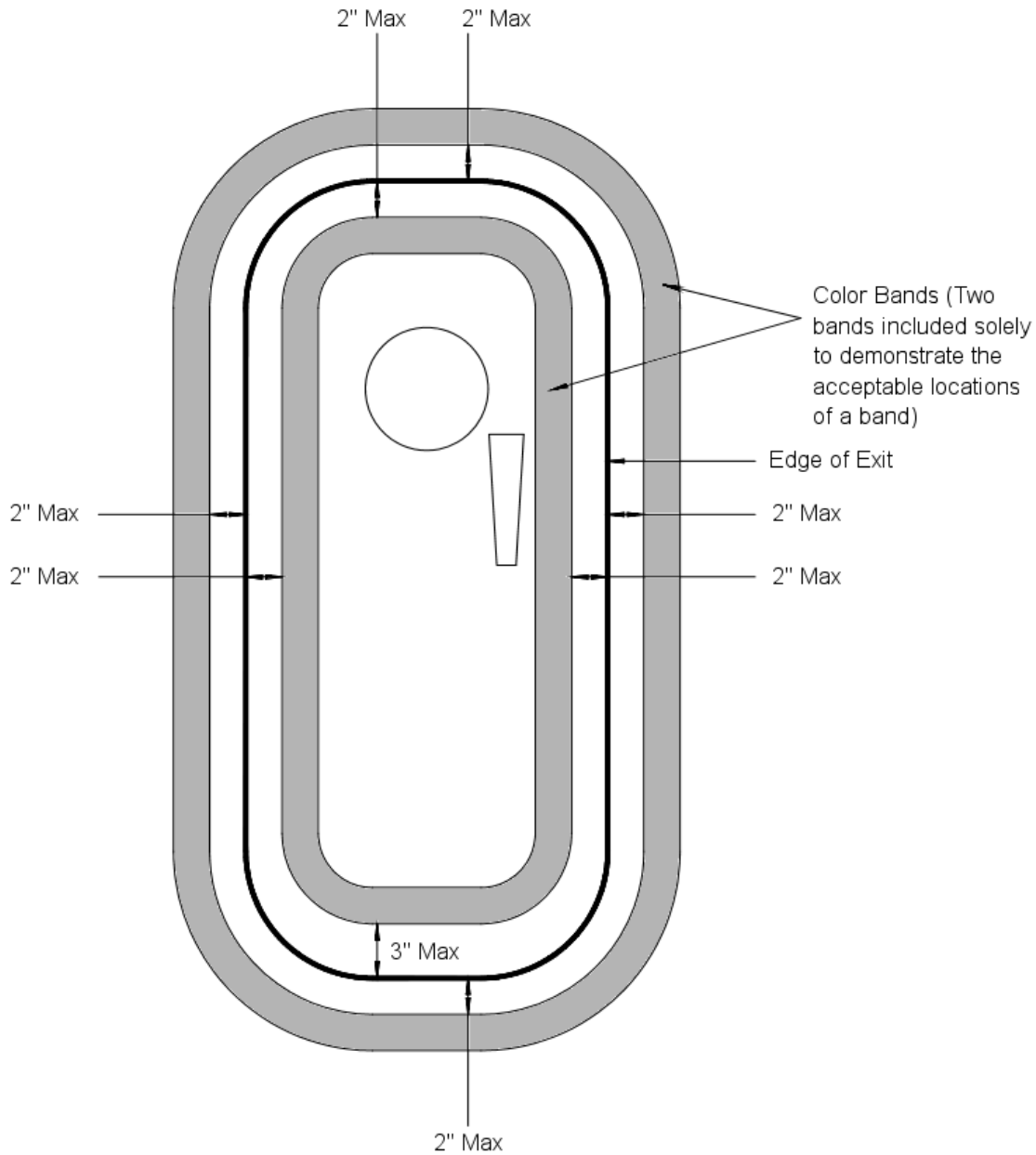
(iii) If exits are deactivated, refer to § 25.807, Amendment 25-15, for guidance regarding deletion of markings for deactivated exits. (Amendment 25-1)

(11) Paragraphs (f)(1) and (2). The FAA issued policy memorandum ANM-03-115-04, dated April 2, 2003, and titled “Policy Statement on Exit Bands.” The policy is applicable to Amendment 25-88 for §§ 25.811(f)(1) and (2) as follows: (Amendment 25-1)

(i) The FAA has been asked if compliance with §§ 25.811(f)(1) and (2) can be found with the lower section of a two-inch colored band located a few-inches above the base of an exit. Metal door sills are often installed on the fuselage below floor-level exits to provide protection from impacts with loading equipment. If the band is located on the bottom edge of an exit, its color must be compared with the door sill color to determine compliance with § 25.811(f)(2). This requirement can result in a color scheme which is not desired by the operator. Note that painting the door sill is not considered a viable option since impacts with loading equipment cause the paint to scratch and wear away quickly. If the band is located a few-inches above the base of the exit, its color is compared with the door color below the band instead of the metal door sill. This results in more color options for operators to choose from in determining a desired color scheme. (Amendment 25-1)

(ii) The purpose of these bands is to assist rescue personnel in recognizing exits in the side of the fuselage. Section 25.811(f)(1) requires that a two-inch color band outline each passenger emergency exit in the side of the fuselage. Advisory Circular 20-47, paragraph 4b, indicates that a color band outlining an exit is considered to comply with applicable regulations whether the band is on the edge of the exit itself, on the fuselage surrounding the exit, or partially on both. Although this guidance indicates acceptance of bands located on the edge of the exit itself, the FAA considers that a band could be located a small distance away from the exit’s edge and still be considered to “outline” the exit as required by § 25.811(f)(1). The FAA finds that for floor-level exits the size of a Type II exit or larger, compliance can be found with the top and side sections of a band located a maximum of 2-inches away from the exit’s edge and the bottom section of a band located between 2-inches below and 3-inches above the exit’s edge. Figure 387-1 is a figure that demonstrates these boundaries. The bottom section of the band is allowed to be farther away from the exit’s edge than the other sides of the band to be consistent with past practices for exits with a door sill installed at their base. Although the band is not required to be on the edge of the exit, it must be parallel to the exit’s edge in order to outline the exit as required by the rule. (Amendment 25-1)

**FIGURE 387-1 ACCEPTABLE COLOR BAND LOCATIONS FOR AN EXIT THE SIZE OF A TYPE II EXIT OR LARGER**



388. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.811 by allowing variations in exit sign size and allowing use of universal symbols, rather than the word “exit.” It requires all passenger emergency exit operating handles to be self-illuminated and replaces prescriptive arrow

requirements with performance-based language. The amendment also requires the design of exit signs be chosen to provide a consistent set throughout the cabin. See <https://drs.faa.gov/browse>.

b. Guidance.

(i) For paragraph (e) of this amendment, refer to EASA CS-25 Book 2, AMC 25.811(e)(4), and the following guidance, for an acceptable method of compliance:

(ii) Paragraph (g). If an approved universal exit symbol is used, § 25.811(g) requires incorporation of a special emphasis briefing on the meaning of the symbolic exit signs in crew procedures, and incorporation of appropriate symbolic/graphical exit sign information in standard passenger information cards. The special emphasis briefing and information cards have been conditions of the FAA's previously approved equivalent safety findings permitting use of symbolic exit signs because the United States public is generally accustomed to text-based exit signs rather than symbolic exit signs. The intent of these measures is to establish, over time, an acceptable overall comprehension of the proposed symbolic exit signs by the United States flying public. The FAA intends to reevaluate the need for these additional measures when symbolic exit signs become more prevalent in the United States. The symbolic green running man standard in GAMA Publication 15 is an acceptable symbol for the exit sign, as well as the EASA-accepted standard in AMC 25.812. If using a universal symbol for the exit sign, include the following as an acceptable method of compliance:

(i) An FAA-accepted special emphasis briefing, to be included in the procedures section of the aircraft flight manual, that directs cabin crew to provide the briefing to the passengers on the meaning of the symbolic exit signs prior to each flight and prior to each landing.

(ii) An FAA-accepted implementation plan that will ensure incorporation of appropriate symbolic/graphical exit sign information in standard passenger information cards (such as those required by §§ 121.571(b), 135.117(e), and 91.1035(f)) at each passenger seat place that may be occupied for taxi, takeoff, and landing. (Amendment 25-XXX)

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unopenable. Therefore, the power supply should be located at a station between the frames that make up the exit, or in the case of a sign beside the exit, the power supply may also be at the same fuselage station as any part of the sign. (Amendment 25-15)

398. AMENDMENT 25-116, Effective November 26, 2004.

a. Regulation. This amendment upgraded the airworthiness standards for transport category airplanes relating to flight attendant assist spaces and handles, door hold-open features, outside viewing means, interior compartment doors, and portable oxygen equipment. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/27A89F8AF00EF63986256F3B006D872C.0001>

b. Guidance. There is no new guidance for this amendment.

399. AMENDMENT 25-128, Effective May 29, 2009.

a. Regulation. This amendment corrected a number of errors in the safety standards for transport category airplanes. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/AAF890D1014941C8862575C50045D303.0001>

b. Guidance. There is no new guidance for this amendment.

400. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.812 to allow use of the universal symbol for an exit and harmonize the language for sign brightness and contrast with EASA. The amendment also changes the requirements for emergency lighting system design, based on passenger capacity, following a single transverse vertical separation of the fuselage during crash landing, to also harmonize with EASA. See <https://drs.faa.gov/browse>.

b. Guidance.

(1) For paragraphs (b), (e)(2), and (l)(1) of this amendment, refer to EASA CS-25 Book 2, AMC 25.812(b)(1), AMC 25.812(b)(2), AMC 25.812(e)(2), and AMC 25.812(l)(1), and the following guidance, for an acceptable method of compliance.

(2) Paragraph (b). If an approved universal exit symbol is used, § 25.811(g) requires incorporation of a special emphasis briefing on the meaning of the symbolic exit signs in crew procedures, and incorporation of appropriate symbolic/graphical exit sign information in standard passenger information cards. The special emphasis briefing and information cards have been conditions of the FAA's previously approved equivalent safety findings permitting use of symbolic exit signs because the United States public is generally accustomed to text-based exit signs rather than symbolic exit signs. The intent of these measures is to establish, over time, an acceptable overall comprehension of the proposed symbolic exit signs by the United States flying public. The FAA intends to reevaluate the need for these additional measures when symbolic exit signs become more prevalent in the United States. The symbolic green running man standard in GAMA Publication 15 is an acceptable symbol for the exit sign, as well as the

EASA-accepted standard in AMC 25.812. If using a universal symbol for the exit sign, include the following as an acceptable method of compliance:

(i) An FAA-accepted special emphasis briefing, to be included in the procedures section of the aircraft flight manual, that directs the cabin crew to brief the passengers on the meaning of the symbolic exit signs prior to each flight and prior to each landing.

(ii) An FAA-accepted implementation plan that will ensure incorporation of appropriate symbolic/graphical exit sign information in standard passenger information cards (such as those required by §§ 121.571(b), 135.117(e), and 91.1035(f)) at each passenger seat place that may be occupied for taxi, takeoff, and landing. (Amendment 25-XXX)

401 – 410. [RESERVED]

(vi) A minor protrusion, not to exceed two-inches, of the outboard seat cushion into the required exit opening is permitted, if the cushion is easily compressed. A force of 170 lbs distributed over 40 square-inches has been found acceptable to determine if the cushion is easily compressed. (Amendment 25-0)

(vii) For the smaller airplanes there could be some minor obstructions, provided that they do not reduce the effectiveness of the exit. Unattached (loose), soft seat-back cushions on side-facing divans, for example, may encroach into the minimum required exit opening provided the cushion can be readily moved away and the exit easily opened from the inside and outside. Other incursions into the projected opening, and even some interference in opening the exit are acceptable for these smaller airplanes, provided the exit maintains its effectiveness, and remains openable. The exit signs may not be obscured. (Amendment 25-32)

(viii) Interior features (galleys, closets, seats, etc.) must not prevent an exit from being opened from either inside or outside. (Amendment 25-32)

(15) Paragraphs (c)(2)(i) and (c)(2)(ii). The wording “a passenger seating configuration, excluding pilot seats,” which was promulgated with the intent of being consistent with Amendment 23-10 to part 23, does not directly address seats intended for use by observers or flight attendants. Seats approved for use by observers or flight attendants are not included in the passenger seating configuration. Seats that have dual approval for occupancy by either crew/observers or passengers will be included in the passenger seating configuration. (Amendment 25-32)

(16) Paragraph (d). The curtains may protrude slightly into the required passageway, provided the curtain and its tie-backs do not inhibit passage. (Amendment 25-1)

(17) Paragraph (e). Arrangements have been found acceptable for a lavatory door where the lavatory would be occupied by one passenger during taxi, takeoff, and landing. This arrangement would require an equivalent level of safety finding. The door should be secured open for taxi, takeoff, and landing and be provided with an emergency egress panel. An emergency egress panel is a panel that can be broken through by a passenger who may be inadvertently trapped behind the door. A demonstration should be done using a 5<sup>th</sup> percentile female subject (approximately 60-inches tall and weighing 102 lbs). (Amendment 25-1)

(18) Paragraph (e). Curtains within a sliding frame are not considered to be a door if a person can easily pass through the curtain when closed. The curtain should be fastened open for taxi, takeoff, and landing. (Refer to paragraph 1041b(7).) (Amendment 25-1)

(19) Paragraph (e). Doors are permitted on galleys, etc. that are between the main aisle and exit if the door is not between passenger compartments. This would also apply to rooms not occupied for taxi, takeoff, and landing. Doors that open into a main aisle should not be permitted in passenger compartments occupiable for taxi, takeoff, or landing or in passenger compartments with passenger emergency exits. These types of compartments are typically found in “executive” interiors with the main aisle along the side wall. (Amendment 25-1)

420. AMENDMENT 25-116, Effective November 26, 2004.

a. Regulation. This amendment upgraded the airworthiness standards for transport category airplanes relating to flight attendant assist spaces and handles, door hold-open features, outside viewing means, interior compartment doors, and portable oxygen equipment. For the requirements of this amendment, see

<https://drs.faa.gov/browse/excelExternalWindow/96C7D0E0984752DA86256F3B006D8790.0001>

<https://drs.faa.gov/browse/excelExternalWindow/96C7D0E0984752DA86256F3B006D8790.0001>

b. Guidance. There is no new guidance for this amendment.

421. AMENDMENT 25-128, Effective May 29, 2009.

a. Regulation. This amendment corrected a number of errors in the safety standards for transport category airplanes. For the requirements of this amendment, see

<https://drs.faa.gov/browse/excelExternalWindow/41DE18427661BBC1862575C50045D36D.0001>

b. Guidance. There is no new guidance for this amendment.

422. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.813 to incorporate several findings of equivalent level of safety and part 121 deviations for all domestic airlines based on extensive research on access and egress of Type III passageways. Research showed that a 13-inch passageway is equivalent to, or better in some cases, than the 20-inch passageway currently required by § 25.813(c). The amendment harmonizes with EASA CS 25.813(c) and aligns with current FAA practice. The amendment also revises the remainder of § 25.813, as well as the section title to “Emergency exit access and ease of operation,” to harmonize with EASA. See <https://drs.faa.gov/browse>.

b. Guidance. For this amendment, refer to EASA CS-25 Book 2, AMC 25.813, AMC 25.813(c), and AMC 25.813(e) for an acceptable method of compliance.

(20) Paragraph (e). Close certain interior doors during taxi, take-off and landing to prevent delay in occupant evacuation. This type of door is to an area that is not occupied during taxi, takeoff, and landing. Passengers seated in taxi, takeoff, and landing seats do not need to pass through this door to access any emergency exit. Close these doors during taxi, takeoff, and landing. Examples of such doors include lavatory doors, crew rest doors, bedroom doors, etc. (Amendment 25-XXX)

423 – 410. [RESERVED]

etc.) from the ceiling should not be positioned in the main aisle. Alternate locations should be used, e.g., over seat, on the side wall etc. These features should also be appropriately padded or rounded to preclude injury when persons are moving about the cabin. (Amendment 25-0)

444 – 460. [RESERVED]

#### SECTION 25.817 MAXIMUM NUMBER OF SEATS ABREAST

461. Section 25.817 Did Not Exist Prior to Amendment 25-15.

462. AMENDMENT 25-15, Effective October 24, 1967.

a. Regulation.

*On airplanes having only one passenger aisle, no more than three seats abreast may be placed on each side of the aisle in any one row.*

b. Guidance. On a twin-aisle airplane, a six-place seat assembly could be installed between the two aisles. (Amendment 25-15)

463 – 480. [RESERVED]

#### SECTION 25.819 LOWER DECK SERVICE COMPARTMENTS (INCLUDING GALLEYS)

481. Section 25.819 Did Not Exist Prior to Amendment 25-53.

482. Amendment 25-53, Effective August 31, 1980.

a. Regulation.

*For airplanes with a service compartment located below the main deck, which may be occupied during taxi or flight but not during takeoff or landing, the following apply:*

*(a) There must be at least two emergency evacuation routes, one at each end of lower deck service compartment, or two having sufficient separation within each compartment, which could be used by each occupant of the lower deck service compartment to rapidly evacuate to the main deck under normal and emergency lighting conditions. The routes must provide for the evacuation of incapacitated persons, with assistance. The use of the evacuation routes may not be dependent on any powered device. The routes must be designed to minimize the possibility of blockage which might result from fire, mechanical or structural failure, or persons standing on top of or against the escape routes. In the event the airplane's main power system or compartment main lighting system should fail, emergency illumination for each lower deck service compartment must be automatically provided.*

*(b) There must be a means for two-way voice communication between the flight deck and each lower deck service compartment.*

*(c) There must be an aural emergency alarm system, audible during normal and emergency conditions, to enable crewmembers on the flight deck and at each required floor level emergency exit to alert occupants of each lower deck service compartment of an emergency situation.*

*(d) There must be a means, readily detectable by occupants of each lower deck service compartment, that indicates when seat belts should be fastened.*

*(e) If a public address system is installed in the airplane, speakers must be provided in each lower deck service compartment.*

*(f) For each occupant permitted in a lower deck service compartment, there must be a forward or aft facing seat which meets the requirements of § 25.785(c) and must be able to withstand maximum flight loads when occupied.*

*(g) For each powered lift system installed between a lower deck service compartment and the main deck for the carriage of persons or equipment, or both, the system must meet the following requirements:*

*(1) Each lift control switch outside the lift, except emergency stop buttons, must be designed to prevent the activation of the lift if the lift door, or the hatch required by paragraph (g)(3) of this section, or both, are open.*

*(2) An emergency stop button, that when activated will immediately stop the lift, must be installed within the lift and at each entrance to the lift.*

*(3) There must be a hatch capable of being used for evacuating persons from the lift that is openable from inside and outside the lift without tools, with the lift in any position.*

b. Guidance.

(1) The following should be used for any installation regardless of certification basis: (Amendment 25-53)

(i) The installation of a lower deck service compartment normally results in cart restraint locations on both the main and lower decks. At these locations, the carts are normally restrained by a fitting in the floor, commonly called a mushroom. There are two typical types of mushrooms. One is usually retractable, located in an aisle or passageway, and capable of restraining the cart for inflight load conditions only. The other mushroom is usually fixed, located in a galley, lift, or cabinet, and generally capable of restraining the cart during taxi, takeoff, and landing (TT&L). If necessary, control of the number of carts allowed on each deck should be provided. For the TT&L condition, there should be enough TT&L mushrooms for each cart on the airplane. In order to be assured the carts can be taken to such a mushroom, there

should be at least two independently powered and controlled lifts between the main and lower decks. If there are not at least two such lifts, it should be demonstrated by actual test that all carts can be transported up or down between decks. It is acceptable to transport the contents and cart separately by average flight attendants. If two such lifts are not installed and transportability is not demonstrated, at any given time, there should not be more carts on one deck than there are TT&L mushrooms. It will be acceptable to have adequate AFM limitations and/or placarding to assure the necessary level of safety. This guidance would be equally applicable if a galley or service compartment is located on a deck above the main deck. (Amendment 25-53)

(ii) Remote compartments should have adequate ventilation and conditioned air for all occupants. If the compartment is one in which occupants are working, such as a galley, more than normal ventilation and conditioned air should be supplied than that for a compartment in which the occupants are seated. If carbon dioxide (dry ice) is used in a compartment, additional ventilation may be necessary to demonstrate compliance with § 25.831(b)(2) for all regimes of operation; such as at the gate, taxi, takeoff, climb, cruise, hold and descent. (Amendment 25-53)

(2) Paragraph (g)(1). Proximity or micro-switches are normally used to sense that the lift door or hatch is open or closed. These interlock switches should be located so that they cannot be easily or inadvertently overridden or deactivated. Special design considerations should be given to these switches to minimize the probability of them becoming damaged during normal use. (Amendment 25-53)

(3) Paragraph (g)(2). The emergency stop buttons are of prime importance and should be given special design considerations. These buttons should have absolute and complete priority over any other control, failure, or lack of control. No matter what condition, failure or sequence of events that have occurred, operation of any emergency stop button should result in stopping of the lift without the ability to override from any other location. (Amendment 25-53)

483. AMENDMENT 25-110, Effective July 21, 2003.

a. Regulation.

*For airplanes with a service compartment located below the main deck, which may be occupied during taxi or flight but not during takeoff or landing, the following apply:*

*(a) There must be at least two emergency evacuation routes, one at each end of lower deck service compartment or two having sufficient separation within each compartment, which could be used by each occupant or the lower deck service compartment to rapidly evacuate to the main deck under normal and emergency lighting conditions. The routes must provide for the evacuation of incapacitated persons, with assistance. The use of the evacuation routes may not be dependent on any powered device. The routes must be designed to minimize the possibility of blockage which might result from fire, mechanical or structural failure, or persons standing on top of or against the escape routes. In the event the airplane's main power system or compartment main lighting system should fail, emergency illumination for each lower deck service compartment must be automatically provided.*

*[(b) There must be a means for two-way voice communication between the flight deck and each lower deck service compartment, which remains available following loss of normal electrical power generating system.]*

*(c) There must be an aural emergency alarm system, audible during normal and emergency conditions, to enable crewmembers on the flight deck and at each required floor level emergency conditions, to enable crewmembers on the flight deck and at each required floor level emergency exit to alert occupants of each lower deck service compartment of an emergency situation.*

*(d) There must be a means, readily detectable by occupants of each lower deck service compartment, that indicates when seat belts should be fastened.*

*(e) If a public address system is installed in the airplane, speakers must be provided in each lower deck service compartment.*

*[(f) For each occupant permitted in a lower deck service compartment, there must be a forward or aft facing seat which meets the requirements of § 25.785(d) and must be able to withstand maximum flight loads when occupied.]*

*(g) For each powered lift system installed between a lower deck service compartment and the main deck for the carriage of persons or equipment, or both, the system must meet the following requirements:*

*(1) Each lift control switch outside the lift, except emergency stop buttons, must be designed to prevent the activation of the lift if the lift door, or the hatch required by paragraph (g)(3) of this section, or both are open.*

*(2) An emergency stop button, that when activated will immediately stop the lift, must be installed within the lift and at each entrance to the lift.*

*(3) There must be a hatch capable of being used for evacuating persons from the lift that is openable from the inside and outside the lift without tools, with the lift in any position.*

**b. Guidance.**

(1) The following should be used for any installation regardless of certification basis: (Amendment 25-53)

(i) The installation of a lower deck service compartment normally results in cart restraint locations on both the main and lower decks. At these locations, the carts are normally restrained by a fitting in the floor, commonly called a mushroom. There are two typical types of mushrooms. One is usually retractable, located in an aisle or passageway, and capable of restraining the cart for inflight load conditions only. The other mushroom is usually fixed, located in a galley, lift or cabinet, and generally capable of restraining the cart during taxi, takeoff, and landing (TT&L). If necessary, control of the number of carts allowed on each deck

should be provided. For the TT&L condition, there should be enough TT&L mushrooms for each cart on the airplane. In order to be assured the carts can be taken to such a mushroom, there should be at least two independently powered and controlled lifts between the main and lower decks. If there are not at least two such lifts, it should be demonstrated by actual test that all carts can be transported up or down between decks. It is acceptable to transport the contents and cart separately by average flight attendants. If two such lifts are not installed and transportability is not demonstrated, at any given time, there should not be more carts on one deck than there are TT&L mushrooms. It will be acceptable to have adequate AFM limitations and/or placarding to assure the necessary level of safety. This guidance would be equally applicable if a galley or service compartment is located on a deck above the main deck. (Amendment 25-53)

(ii) Remote compartments should have adequate ventilation and conditioned air for all occupants. If the compartment is one in which occupants are working, such as a galley, more than normal ventilation and conditioned air should be supplied than that for a compartment in which the occupants are seated. If carbon dioxide (dry ice) is used in a compartment, additional ventilation may be necessary to demonstrate compliance with § 25.831(b)(2) for all regimes of operation; such as at the gate, taxi, takeoff, climb, cruise, hold and descent. (Amendment 25-53)

(2) Paragraph (g)(1). Proximity or micro-switches are normally used to sense that the lift door or hatch is open or closed. These interlock switches should be located so that they cannot be easily or inadvertently overridden or deactivated. Special design considerations should be given to these switches to minimize the probability of them becoming damaged during normal use. (Amendment 25-53)

(3) Paragraph (g)(2). The emergency stop buttons are of prime importance and should be given special design considerations. These buttons should have absolute and complete priority over any other control, failure, or lack of control. No matter what condition, failure or sequence of events that have occurred, operation of any emergency stop button should result in stopping of the lift without the ability to override from any other location. (Amendment 25-53)

484 – 500. [RESERVED]

## SECTION 25.821 GENERAL CABIN ARRANGEMENT

501. Section 25.821 Did Not Exist Prior to Amendment 25-XXX.

502. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment introduces requirements for interior doors, isolated compartments, and deactivation of emergency exits for low occupancy airplanes and non-commercially operated airplanes. See <https://drs.faa.gov/browse>.

b. Guidance.

(1) Refer to EASA CS-25 Book 2, AMC to appendix S, S25.10(a) and S25.10(b) for interior doors, S25.10(c) for isolated compartments, S25.10(d) and (e) for deactivation and

distance between emergency exits, and the following guidance, for an acceptable method of compliance for isolated compartment closets and stowage compartments.

(2) Each closet and stowage compartment in an isolated compartment, except for under-seat compartments for occupant convenience, should be completely enclosed. All enclosed closet and stowage compartments within the isolated compartment that are not limited to stowage of emergency equipment or airplane supplied equipment (e.g., bedding) should meet the design criteria given in table 502-1 below. Any closet or enclosed stowage compartments greater than 200 ft<sup>3</sup> (5.66 m<sup>3</sup>) in interior volume should be addressed by special conditions. The in-flight accessibility of very large enclosed stowage compartments, and the subsequent impact on the crew's ability to effectively reach any part of the compartment with the contents of a hand fire extinguisher, may require additional fire protection features similar to those required for inaccessible compartments such as Class C cargo compartments.

(i) Materials of Construction. Materials used to construct enclosed closets or stowage compartments should be fire resistant and meet the flammability standards for interior components under § 25.853. See also DOT/FAA/TC-17/55, "Aircraft Materials Fire Test Handbook," Revision 3, dated July 2019, <https://www.fire.tc.faa.gov/pdf/TC17-55.pdf>. For compartments less than 25 ft<sup>3</sup> (0.71 m<sup>3</sup>) in interior volume, the design should be able to contain a fire likely to occur within the compartment under normal use.

(ii) Smoke or Fire Detectors. Enclosed closets or stowage compartments equal to or exceeding 25 ft<sup>3</sup> (0.71 m<sup>3</sup>) in interior volume should include a smoke or fire detection system to ensure a fire can be detected within one minute, unless it can be shown that smoke within the closet or stowage compartment will be detected by the smoke detector located in the isolated compartment (e.g., through grilles/louvers in the closet or stowage door). Flight tests should be conducted to show compliance with this condition. For smoke detection demonstration, AC 25-9A, "Smoke Detection, Penetration and Evacuation Tests and Related Flight Manual Emergency Procedures," provides acceptable means of compliance. Each system should provide (1) a visual indication in the flightdeck within one minute after the start of a fire, and (2) an aural or visual warning in the cabin.

(iii) Liners. If it can be shown that the material used to construct the stowage compartment meets the flammability requirements of a liner for a Class B cargo compartment (i.e., § 25.855 at Amendment 25-142, and appendix F, part I, paragraph (a)(2)(ii)), then no liner would be required for enclosed stowage compartments equal to or greater than 25 ft<sup>3</sup> (0.71 m<sup>3</sup>) in interior volume but less than 57 ft<sup>3</sup> (1.61 m<sup>3</sup>) in interior volume. For all enclosed stowage compartments equal to or greater than 57 ft<sup>3</sup> (1.61 m<sup>3</sup>) in interior volume but less than or equal to 200 ft<sup>3</sup> (5.66 m<sup>3</sup>), a liner should be provided that meets the requirements of § 25.855 for a Class B cargo compartment.

(iv) Locating Devices. Isolated compartments that contain multiple enclosed closets or stowage compartments exceeding 25 ft<sup>3</sup> (0.71 m<sup>3</sup>) in interior volume and that are located away from one central location, such as the entry to the isolated compartment should incorporate additional fire protection systems or devices, or both, to assist the firefighter in determining the location of a fire.

**Table 502-1 Fire Protection Requirements by Closet or Stowage  
Compartment Interior Volumes**

<b>Fire Protection System Features</b>	<b>Less than 25 ft<sup>3</sup> (0.71 m<sup>3</sup>)</b>	<b>25 ft<sup>3</sup> (0.71 m<sup>3</sup>) to less than 57 ft<sup>3</sup> (1.61 m<sup>3</sup>)</b>	<b>57 ft<sup>3</sup> (1.61 m<sup>3</sup>) to 200 ft<sup>3</sup> (5.66 m<sup>3</sup>)</b>
Material of Construction	Yes	Yes	Yes
Smoke or Fire Detectors	No	Yes	Yes
Liners	No	Conditional	Yes
Fire Locating Devices	No	Yes	Yes

(3) Closet or storage interior volume by itself may not provide adequate means to limit the adverse effect of a fire within an airplane. Critical systems and structure adjacent to the closet or stowage compartment may require additional mitigation means to ensure an acceptable level of airplane safety. For example, if the isolated compartment design located a closet or stowage compartment with an interior volume of 10 ft<sup>3</sup> (0.28 m<sup>3</sup>) adjacent to a pneumatic duct or critical electrical equipment, then an additional acceptable mitigating feature could include a fire or smoke detector. The airplane manufacturer or modifier should ensure that a fire within a closet or stowage compartment will not adversely affect safety on critical systems and structure located adjacent to closets and stowage compartments provided in their design.

503 – 510. [RESERVED]

#### SECTION 25.823 EMERGENCY EVACUATION AND FLAMMABILITY

511. Section 25.823 Did Not Exist Prior to Amendment 25-XXX.

512. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment introduces requirements for flammability and access to Type III and Type IV emergency exits for low occupancy airplanes and non-commercially operated airplanes. See <https://drs.faa.gov/browse>.

b. Guidance. Refer to EASA CS-25 Book 2, AMC to appendix S, S25.20(a)(1), S25.20(b), and S25.20(b)(1), and the following guidance, for an acceptable method of compliance. However, § 25.823(b)(2) does not include the terms of EASA CS-25 S25.20(b)(2). FAA does not accept the terms of this provision (EASA S25.20(b)(2)). FAA considers EASA S25.20(b)(2) insufficient for two main reasons. First, the conditions for a demonstration are necessarily non-hazardous. Under actual emergency conditions (such as smoke in the cabin, adverse airplane attitude, or fuselage disruption), unobstructed access can be much more important than in a demonstration. Second, the Type IV exit is only permitted for airplanes with 9 or fewer

passengers. While a Type IV exit does provide some evacuation capability, that capability is not sufficient for airplanes of the size addressed by the rule, thus is not an adequate lower bound on exit effectiveness. Conversely, the use of crew alerts and mandatory procedures, as in S25.20(b)(1) and S25.20(b)(3), are well-established practices for safety critical actions.

513 – 520. [RESERVED]

#### SECTION 25.825 MOVEMENT INSIDE CABIN DURING FLIGHT

521. Section 25.825 Did Not Exist Prior to Amendment 25-XXX.

522. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment introduces requirements for width of aisle and firm handholds for low occupancy airplanes and non-commercially operated airplanes. See <https://drs.faa.gov/browse>.

b. Guidance. Refer to EASA CS-25 Book 2, AMC to appendix S, S25.30(a) and S25.30(b) for an acceptable method of compliance.

523 – 530. [RESERVED]

#### SECTION 25.827 MARKINGS AND PLACARDS

531. Section 25.827 Did Not Exist Prior to Amendment 25-XXX.

532. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment introduces requirements for no smoking placards, briefing card and placards, and seats in excess for low occupancy airplanes and non-commercially operated airplanes. See <https://drs.faa.gov/browse>.

b. Guidance. Refer to EASA CS-25 Book 2, AMC to appendix S, S25.40(b) and S25.40(c) and the following guidance for 25.827 for an acceptable method of compliance. Paragraph CS-25 S25.40(a) permits relief from CS 25.791(a), CS 25.791(d), and CS 25.853(g) for both low occupancy and non-commercially operated airplanes. FAA finds such relief appropriate for non-commercially operated airplanes but not for commercially operated, low occupancy airplanes. The reasons FAA is maintaining requirements for disposal means for lit cigarettes are discussed in § 25.853(g), paragraph 635 of this AC. FAA has provided exclusions to this requirement for non-commercially operated airplanes because persons flying on non-commercially operated airplanes typically have more knowledge and familiarity in doing so.

533 – 540. [RESERVED]

## SECTION 25.829 CABIN CREW DIRECT VIEW

541. Section 25.829 Did Not Exist Prior to Amendment 25-XXX.

542. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment introduces requirements for cabin crew direct view for low occupancy airplanes and non-commercially operated airplanes. See <https://drs.faa.gov/browse>.

b. Guidance. There is no guidance for this amendment.

543 – 550. [RESERVED]

## SECTION 25.830 SECURITY CONSIDERATIONS FOR NON-COMMERCIALY OPERATED AIRPLANES

551. Section 25.830 Did Not Exist Prior to Amendment 25-XXX

552. Amendment 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment introduces requirements for security considerations for non-commercially operated airplanes. See <https://drs.faa.gov/browse>.

b. Guidance. There is no guidance for this amendment.

553-600. [RESERVED]

(8) Paragraph (a). Oxygen lines are considered ducted systems and should be tested in their normal state: pressurized to the maximum operating pressure with a gas considered safe for testing. Refer to paragraph 621b(4) above. (Amendment 25-32)

(9) Paragraph (a). As required by Appendix F, foam shall be tested in 1/2-inch thickness. If the cushion consists of two or more foams glued together, the foam specimens should be two 1/4-inch (three 1/6-inch, etc.) pieces glued together. Three specimens should be made for each combination of foams that are glued together in the production cushion. Any other production cushion components that are glued together, should be tested together. If such specimens do not pass, it is acceptable to test each production cushion component separately, including a sheet of glue. Additionally, the Bunsen burner is then applied to three separate corners of the production cushion with all its components. The cushion is satisfactory if all tests meet the test criteria. The three corner tests need not be conducted, if the cushion passes the tests of part II of Appendix F at Amendment 25-59. (Amendment 25-32)

(10) Paragraph (a). Blankets, pillows, headrest covers, and carry-on items that are not part of the aircraft type design are not required to meet the flammability standards. (Amendment 25-32)

(11) Paragraphs (a). Refer to AC 25-10, "Guidance for Installation of Miscellaneous, Nonrequired Electrical Equipment," dated 3/6/87. (Amendment 25-32)

(12) Paragraph (c). Refer to AC 25.853-1, "Flammability Requirements for Aircraft Seat Cushions," dated 9/17/86. (Amendment 25-59)

(13) Paragraph (d). Some first or business class seats incorporate large panel assemblies, in the form of wall panels, partitions, large cabinets, or stowage compartments. The surface areas of these components are significant and therefore these components of the seat are subject to this requirement, just as regular wall panels, partitions, cabinets, and stowage compartments in the cabin. All components that make up an affected part (for example, several small panels that make up a large ceiling panel) are required to comply with the standard applicable to the larger part. Therefore, the wall panels, partitions, large cabinets, and stowage compartments of the seat itself, including panel assemblies of consoles, are required to comply with Appendix F, parts IV and V, of part 25. (Amendment 25-61)

(14) Paragraph (d). Compartments which are isolated from the passenger cabin by a door, that is required to be closed during takeoff and landing, or equivalent means need not comply with Appendix F, parts IV and V, of part 25. (Amendment 25-61)

(15) Paragraph (d). As a general guidance for compliance with comply with Appendix F, parts IV and V, of part 25, components identified in § 25.853(a-1) with surface areas of one square foot or less may be considered small enough that they do not have to meet the new flammability standards. Components with surface areas greater than two square feet may be considered large enough that they do have to meet the new standards. Those with surface areas greater than one square foot, but less than two square feet, would have to be considered in conjunction with the areas of the cabin in which they are installed before a determination could be made. (Amendment 25-61)

(16) Paragraph (f). Self-contained is defined as a receptacle within a receptacle, one of which has a lid. Both receptacles are considered trash containers and should meet fire-resistant criteria as defined in 14 CFR, part 1, § 1.1 and in the preceding guidance in paragraph 621b(2) of this AC. The fixed receptacle should be sealed to prevent penetration of fire or residue into the surrounding area. Ashtrays installed in movable or removable armrests which will spill their contents when the armrest is moved or raised, as in the case of hinged armrests, are not considered self-contained. (Amendment 25-0)

(17) Paragraph (g). These requirements reflect those of Airworthiness Directive (AD) 74-08-09, effective April 30, 1974. (Amendment 25-51)

(18) Paragraph (h). To meet the “fire resistant” requirements, the receptacle construction should meet the 45-degree burn test described in § 25.855(a-1), Amendment 25-32. (Amendment 25-32)

(19) Paragraph (h). Waste receptacles may be mounted in the airplane structure or may be portable units such as food or waste carts. Fire containment testing is not required for special purpose disposal receptacles (for such items as used air sickness bags and sanitary napkins), which are in addition to the normal waste disposal receptacles found in lavatories. The reasons for not requiring the testing is that these receptacles are typically very small, less than half a cubic foot in volume, and that they contain specific waste which are of a relatively non-flammable nature. Appendix 8 contains methodology for substantiating compliance with fire containment criteria. (Amendment 25-0)

(20) Note: The FAA Memorandum 00-115-16, dated September 12, 2000, titled, “Use of the Aircraft Fire Test Handbook” provides guidance for the use of the Report No. DOT/FAA/CT-99/15 titled, “Aircraft Fire Test Handbook” that may be used to show compliance with, or demonstrate an equivalent level of safety to, the applicable regulations. The test methods described in the handbook are intended to be adopted in total, if they are used. That is, use of a portion of a test method from the handbook, and another portion of the test method from Appendix F, is not automatically acceptable. (Amendment 25-0)

633. AMENDMENT 25-116, Effective November 26, 2004.

a. Regulation. This amendment revises § 25.853(f) as follows:

\* \* \* \* \*

*(f) Smoking is not allowed in lavatories. If smoking is allowed in any area occupied by the crew or passengers, an adequate number of self-contained, removable ashtrays must be provided in designated smoking sections for all seated occupants.*

\* \* \* \* \*

b. Guidance. There is no new guidance for this amendment.

634. [RESERVED]

635. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.853(g) as follows:

\* \* \* \*

*(g) Regardless of whether smoking is allowed in any part of the airplane, lavatories must have an approved means to safely dispose of lit combustible material located conspicuously on or near the entry side of each lavatory door, except that one means may serve more than one lavatory door if the means can be seen readily from the cabin side of each lavatory served.*

\* \* \* \*

b. Guidance. A self-contained, removable ashtray is an approved means. Smoking is prohibited onboard airplanes operated under 14 CFR part 121, and it is prohibited in all lavatories. Data shows, however, that despite the placards and pre-flight briefings, passengers still light cigarettes in lavatories and in the passenger cabin. FAA records show that FAA initiated at least 345 enforcement actions during a 5-year period (2019 to 2024) for violations of the smoking prohibitions on board U.S.-based carriers.

636 – 640. [RESERVED]

## SECTION 25.854 LAVATORY FIRE PROTECTION

641. Section 25.854 Did Not Exist Prior to Amendment 25-74.

642. AMENDMENT 25-74, Effective May 16, 1991.

a. Regulation.

*[For airplanes with a passenger capacity of 20 or more:*

*(a) Each lavatory must be equipped with a smoke detector system or equivalent that provides a warning light in the cockpit, or provides a warning light or audible warning in the passenger cabin that would be readily detected by a flight attendant; and*

*(b) Each lavatory must be equipped with a built-in fire extinguisher for each disposal receptacle for towels, paper, or waste, located within the lavatory. The extinguisher must be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in that receptacle.]*

b. Guidance.

(1) Paragraph (a). Relative to lavatory smoke detectors, the following is quoted from the preamble to Amendment 121-185, effective April 29, 1985: “Unless some circumstance or design feature unforeseen at this time requires otherwise, materials used in the construction of relatively small commercially available smoke detectors would not contribute significantly to the propagation of a fire and would be covered by the small parts exclusion of § 25.853(a).” (Amendment 25-32)

(2) Paragraph (a). Refer to AC 25-9A, “Smoke Detection, Penetration, and Evacuation Test, and Related Flight Manual Emergency Procedures,” dated 1/6/94. (Amendment 25-74)

(3) Paragraph (b). The FAA has issued report number DOT/FAA/AR-96/122, titled “Development of a Minimum Performance Standard for Lavatory Trash Receptacle Automatic Fire Extinguishers,” dated February 1997 that can be used to develop a replacement for the Halon fire extinguishers used in lavatory trash receptacles. (Amendment 25-74)

643. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises the introductory text of § 25.854 as follows:

*For airplanes with a passenger capacity of 20 or more, or with a cabin length of 60 feet (18.29 meters) or more:*

\* \* \* \*

b. Guidance. For this amendment, refer to EASA CS-25 Book 2, AMC 25.854 for an acceptable method of compliance for cabin length measurement. The guidance in paragraph 642.b. of this AC remains applicable.

644 – 650. [RESERVED]

(v) Liner materials must currently meet the same flame penetration standards regardless of the class of compartment in which they are used. (Amendment 25-32)

(vi) No specific volume limits were established for the various classes of compartments although, as noted above, Class A compartments were envisioned as small, open compartments located in the cockpit area. (Amendment 25-32)

(vii) A nonaccessible compartment located below the main cabin could be either a Class C compartment for passenger airplanes or Class C, or E for all cargo airplanes. Cabin flooring utilized to protect adjacent structure from fire originating in a cargo or baggage compartment located above the floor should not also serve as the lining for a compartment located below the floor. (Amendment 25-32)

(3) Paragraphs (b)(3), (c)(1), and (e)(2). An acceptable detection time for smoke detectors is 5 minutes. Use the smoke quantity and location criteria of AC 25-9A, "Smoke Detection, Penetration, and Evacuation Tests, and Related Flight Manual Emergency Procedures," dated 1/6/94, for showing that the smoke detection system detects a fire in satisfactory time. The time for fire detection systems was changed to one minute by Amendment 25-54 in § 25.858. (Amendment 25-0)

(4) Paragraphs (b), (c), and (e). Refer to AC 25-9A, "Smoke Detection, Penetration, and Evacuation Test, and Related Flight Manual Emergency Procedures," dated 1/6/94. (Amendment 25-0)

(5) Paragraphs (b), (c), and (e). The lining discussed in the Class B, C, and E, compartments refers to the sidewalls, ceilings and forward and aft panels of the compartments. (Amendment 25-0)

675. AMENDMENT 25-142, Effective April 18, 2016.

a. Regulation. For the requirements of this amendment, see <https://drs.faa.gov/browse/excelExternalWindow/DAE81F839297FF3586257F990060C52A.000>  
1 b. Guidance. For guidance on this amendment, see AC 25.857-1, "Class B and F Cargo Compartments," dated February 3, 2016.

676. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.857(e) and (e)(1) as follows:

*(e) Class E. A Class E cargo compartment is one on airplanes [used for] the carriage of cargo and in which—*

*(1) [Authorized persons, as defined in § 121.583, are permitted to be carried in airplanes with Class E cargo compartments, provided that the requirements of § 25.797 are met.]*

b. Guidance. There is no new guidance for this amendment.

677 – 730. [RESERVED]

## SECTION 25.1365 ELECTRICAL APPLIANCES, MOTORS, AND TRANSFORMERS

791. Section 25.1365 Did Not Exist Prior to Amendment 25-123.

792. AMENDMENT 25-123, Effective December 10, 2007.

a. Regulation.

*(a) Domestic appliances must be designed and installed so that in the event of failures of the electrical supply or control system, the requirements of § 25.1309(b), (c), and (d) will be satisfied. Domestic appliances are items such as cooktops, ovens, coffee makers, water heaters, refrigerators, and toilet flush systems that are placed on the airplane to provide service amenities to passengers.*

*(b) Galleys and cooking appliances must be installed in a way that minimizes risk of overheating or fire.*

*(c) Domestic appliances, particularly those in galley areas, must be installed or protected so as to prevent damage or contamination of other equipment or systems from fluids or vapors which may be present during normal operation or as a result of spillage, if such damage or contamination could create a hazardous condition.*

*(d) Unless compliance with § 25.1309(b) is provided by the circuit protective device required by § 25.1357(a), electric motors and transformers, including those installed in domestic systems, must have a suitable thermal protection device to prevent overheating under normal operation and failure conditions, if overheating could create a smoke or fire hazard.*

b. Guidance. For guidance on this amendment, see AC 25.1365-1, “Electrical Appliances, Motors, and Transformers,” dated November 27, 2007.

793. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.1365(b) as follows:

\* \* \* \*

*(b) [The installation of] galleys and cooking appliances must [be such as to minimize the risk of overheating, fire, burns, or spilled hot liquids, to the airplane, passengers, and crew].*

\* \* \* \*

b. Guidance. For this amendment, refer to EASA CS-25 Book 2, AMC 25.1365(b) for an acceptable method of compliance, in addition to the guidance in paragraph 792.b. of this AC.

794 – 800. [RESERVED]

bunks or lavatories, a streamer of webbing attached to the mask is acceptable to enable the person to pull the mask down to them. (Amendment 25-0)

(2) Paragraph (c)(1). In order to be assured the dispensing units (masks) are presented before the cabin altitude exceeds 15,000 feet, all system tolerances should be considered. Generally, the aneroid has a broad altitude range of actuation: as much as 2000 feet. It will be acceptable if the upper altitude limit is such as 14,500 feet, thus assuring that the masks will be presented by a cabin altitude of 15,000 feet. This identical guidance has been applied since Amendment 4b-9, effective September 1, 1958, to CAR 4b. This altitude was associated with the requirements of § 25.841(a) (CAR 4b.374(b)), which requires a cabin altitude of no more than 15,000 feet after a reasonably probable pressurization system failure and § 121.329(c)(3) which requires that 100 percent of the passengers be provided oxygen above a cabin altitude of 15,000 feet. (Amendment 25-41)

(3) Paragraph (c)(1). The reason for these extra masks is stated in the preamble to Amendment 4b-9, effective September 1, 1958, to CAR 4b. “The cabin attendants, in the course of their normal duties may be at any place in the cabin at the time of depressurization. Since at the normal cruising altitude of turbine-powered airplanes sufficient time may not be available for the attendants to return to a designated oxygen station, it is necessary that either a portable oxygen supply be carried by each attendant or that sufficient additional outlets and units of dispensing equipment be immediately available throughout the cabin to insure that it will be attainable at all times.” From a practical standpoint, these extra masks can and will also be used for children seated on an adult's lap. (Amendment 25-0)

(4) Paragraph (c)(4). If a portable oxygen bottle is installed for both first aid and flight attendant use, the bottle must be placarded to clearly indicate the quantity of oxygen intended for each purpose. The placard should also indicate which mask, outlet and/or setting should be used. (Amendment 25-0)

(5) Paragraph (c)(4). Portable oxygen bottles intended for flight attendant use need not be installed at a flight attendant station. The bottles should have, to the degree practicable, a uniform distribution in the cabin and be immediately available. There need only be one bottle for each required flight attendant: to comply with § 121.391 or for example, if more flight attendants are used in the evacuation test, the higher number is required. There need not be one bottle for each flight attendant seat. (Amendment 25-0)

974. AMENDMENT 25-116, Effective November 26, 2004.

a. Regulation. This amendment revises § 25.1447(c)(4) as follows:

\* \* \* \*

*(c)(4) Portable oxygen equipment must be immediately available for each cabin attendant. The portable oxygen equipment must have the oxygen dispensing unit connected to the portable oxygen supply.*

\* \* \* \*

b. Guidance. For this amendment, refer to EASA CS-25 Book 2, AMC 25.1447(c)(4) for an acceptable method of compliance.

975. [RESERVED]

976. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment revises § 25.1447(c)(6) as follows:

\* \* \* \*

*(c)(6) There must be sufficient outlets and units of dispensing equipment of a type similar to that required by paragraph (c)(1) of this section in all other areas that may be occupied by passengers or flight crewmembers during flight.*

\* \* \* \*

b. Guidance. For this amendment, refer to EASA CS-25 Book 2, AMC 25.1447(c)(3) for an acceptable method of compliance.

977 – 1010. [RESERVED]

(c) *Stowage provisions for required emergency equipment must be conspicuously marked to identify the contents and facilitate [the easy] removal of the equipment.*

(d) *Each life raft must have obviously marked operating instructions.*

(e) *Approved survival equipment must be marked for identification and method of operation.*

b. Guidance.

(1) Paragraph (b). Equipment such as fire extinguishers, located in clear view, need not have an arrow or other indicators pointing to location. However, the location should be clearly marked to indicate what equipment goes in that location should that equipment be removed. (Amendment 25-0)

(2) Paragraph (c). If the slide, slide/raft and/or locator transmitter is installed in a container on the exit, the container should be marked "SLIDE," "SLIDE/RAFT," and/or "LOCATOR TRANSMITTER," as applicable. (Refer to paragraphs 101b(1), 801b(1)(ii), and 1041b(5).) (Amendment 25-0)

1103 - 1110. [RESERVED]

SECTION 25.1583 OPERATING LIMITATIONS FOR NON-COMMERCIALY OPERATED AIRPLANES

1111. Section 25.1583 For the requirements of this section for amendments zero through 130, see <https://drs.faa.gov/browse/excelExternalWindow/2CCA95BC9D91B5D9862577B20049A929.000>  
1

1112. AMENDMENT 25-XXX, Effective \*\*, \*\*.

a. Regulation. This amendment adds § 25.1583(j) as follows:

\* \* \* \*

*(j) Limitation for non-commercially operated airplanes. If the proposed design's compliance with any one of the requirements of §§ 25.821 through 25.830 relies on the airplane's limitation to non-commercial operations, this limitation must be included in the Limitations Section of the Airplane Flight Manual.*

b. Guidance. This section requires applicants include limitations in the Limitations Section of the Airplane Flight Manual for airplanes that incorporate interior features that are permitted only in non-commercially operated airplanes. This limitation would ensure those airplanes are not offered for hire or common carriage.

1113 – 1150 [RESERVED]

APPENDIX 3  
CRASHWORTHINESS ADVISORY CIRCULARS

AC No.	Title	Date
20-33B	Technical Information Regarding Civil Aeronautics Manuals 1, 3, 4a, 4b, 5, 6, 7, 8, 9, 13, and 14	May 1, 1975
20-36T	Technical Standard Order Index of Articles <b>Note:</b> This AC has been cancelled. The TSO Index of Articles is available in electronic format at <a href="https://www.faa.gov/dynamic-regulatory-system">Dynamic Regulatory System (faa.gov)</a>	October 1, 1997
20-38A	Measurement of Cabin Interior Emergency Illumination in Transport Airplanes <b>Note:</b> This AC has been cancelled by AC 25-17A.	February 8, 1966
20-41A	Substitute Technical Standard Order (TSO) Aircraft Equipment	April 5, 1977
20-42D	Hand Fire Extinguishers for Use in Aircraft	January 14, 2011
20-47	Exterior Colored Band Around Exits on Transport Airplanes	February 8, 1966
20-56A	Marking of TSO-C72b Individual Flotation Devices	April 1, 1975
20-60	Accessibility to Excess Emergency Exits <b>Note:</b> This AC has been cancelled by AC 25-17A.	July 18, 1968
20-110L	Index of Aviation Technical Standard Orders <b>Note:</b> This AC has been cancelled. The index of TSOs is available at <a href="https://www.faa.gov/dynamic-regulatory-system">Dynamic Regulatory System (faa.gov)</a> , and guidance for applying for TSO authorization is provided in AC 21-46A, dated February 23, 2017.	October 10, 2020

AC No.	Title	Date
20-118A	Emergency Evacuation Demonstration From Small Airplanes	March 9, 1987
20-146A	Methodology for Dynamic Seat Certification by Analysis for use in Parts 23, 25, 27, and 29 Airplanes and Rotorcraft	June 29, 2018
20-168	Certification Guidance for Installation of Non-Essential, Non-Required Aircraft Cabin Systems & Equipment (CS&E)	July 22, 2010
21-22	Injury Criteria for Human Exposure to Impact	June 20, 1985
21-46A	Technical Standard Order Program	February 23, 2017
21-25B	Approval of Modified Seating Systems Initially Approved Under a Technical Standard Order	January 11, 2016
21-34	Shoulder Harness-Safety Belt Installations	June 4, 1993
23-2A	Flammability Tests*	May 11, 2007
23-17C	System and Equipment Guide for Certification of Part 23 Airplanes*	November 17, 2011
25-5	Installation Approval on Transport Category Airplanes of Cargo Unit Load Devices Approved as Meeting the Criteria in NAS 3610 <b>Note:</b> This AC has been cancelled by AC 20-168.	June 3, 1970
25-9A	Smoke Detection, Penetration, and Evacuation Tests, and Related Flight Manual Emergency Procedures	January 6, 1994

AC No.	Title	Date
25-10	Guidance for Installation of Miscellaneous, Nonrequired Electrical Equipment <b>Note:</b> This AC has been cancelled by AC 20-168.	March 6, 1987
25-16	Electrical Fault and Fire Prevention and Protection	April 5, 1991
25-18	Transport Category Airplanes Modified for Cargo Service	January 6, 1994
25.562-1B	Dynamic Evaluation of Seat Restraint Systems and Occupant Protection on Transport Airplanes	January 10, 2006
25.783-1A	Fuselage Doors, Hatches and Exits	April 25, 2005
25.785-1B	Flight Attendant Seat and Torso Restraint System Installations	May 11, 2010
25.795-1A	Flightdeck Intrusion resistance	October 24, 2008
25.795-2A	Flightdeck Penetration Resistance	October 24, 2008
25.795-3	Flightdeck Protection (Smoke and Fumes)	October 24, 2008
25.795-4	Passenger Cabin Smoke Protection	October 24, 2008
25.795-5	Cargo Compartment Fire Suppression	October 24, 2008
25.795-6	Least Risk Bomb Location	October 24, 2008
25.795-7	Survivability of Systems	October 24, 2008
25.795-8	Interior Design to Facilitate Searches	October 24, 2008
25.795-9	Chemical Oxygen Generator Security Standards	March 11, 2014
25.803-1A	Emergency Evacuation Demonstrations	March 12, 2012
25.807-1	Uniform Distribution of Exits	August, 13 1990
25.812-1A	Floor Proximity Emergency Escape Path Marking	May 22, 1989
25.812-2	Floor Proximity Emergency Escape Path Marking Systems Incorporating Photoluminescent Element	July 24, 1997
25.853-1	Flammability Requirements for Aircraft Seat Cushions	September 17, 1986

AC No.	Title	Date
25.856-1	Thermal/Acoustic insulation flame propagation test method details	June 24, 2005
25.856-2A	Installation of thermal/acoustic insulation for burnthrough protection	July 29, 2008
25.857-1	Class B and F Cargo Compartments	February 3, 2016
25.1365-1	Electrical Appliances, Motors, and Transformers	November 27, 2007
27-1B Change 8	Certification of Normal Category Rotorcraft	June 29, 2018
29-2C Change 8	Certification of Transport Category Rotorcraft	July 2, 2018
43.13-1B Change 1	Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair	September 27, 2001
43.13-2B	Acceptable Methods, Techniques and Practices - Aircraft Alterations	March 3, 2008
61-107B Change 1	Aircraft Operations at Altitudes Above 25,000 Feet Mean Sea Level or Mach Numbers Greater Than .75	September 9, 2015
91-8B	Use of Oxygen by Aviation Pilots/Passengers <b>Note:</b> This AC has been cancelled by AC 61-107, dated January 23, 1991.	April 7, 1982
91-76A	Hazard Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft	May 25, 2009
103-4	Hazard Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft <b>Note:</b> This AC has been cancelled by AC 91-76, dated September 30, 2004.	May 1, 1974
120-38	Transport Category Airplanes Cabin Ozone Concentrations	October 10, 1980
120-47	Survival Equipment for Use in Overwater Operations	June 12, 1987
121-24E	Passenger Safety Information Briefing and Briefing Cards	August 29, 2024

\* Not directly applicable to part 25 airplanes.

APPENDIX 7  
AMENDMENT BY AMENDMENT HISTORY OF  
CRASHWORTHINESS REQUIREMENTS

The purpose of this appendix is to provide a synopsis of how the crashworthiness requirements have evolved over time. The highlights of each amendment with significant crashworthiness implications are presented to familiarize the reader with the chronology of the most significant changes.

Amendment 25-0 (effective 2/1/65), Recodification and New Part 25

This amendment was part of the Agency's recodification program to streamline and clarify the then present regulatory language and delete obsolete or redundant provisions. Accordingly, a new part 25 was added to the 14 CFR to replace part 4b of the Civil Air Regulations. There was no attempt to incorporate substantive changes, other than relaxatory ones that were completely noncontroversial.

Amendment 25-1 (effective 6/7/65), Improved Emergency Evacuation Equipment

This amendment prescribed revisions and new standards for:

- Fitting of ropes at Type III and Type IV exits to facilitate emergency egress for landplanes (§ 25.809).
- Exterior marking of emergency exits (§ 25.811).
- Emergency exit locating signs and exit-opening instructions (§ 25.811).
- Emergency cabin illumination in a crash landing or upon interruption of the airplane's normal electrical power (§ 25.811).
- Minimum passageway requirements between individual passenger areas and emergency exits (§ 25.813).
- Strength requirements for latches designed to keep certain interior doors open during takeoffs and landings (§ 25.813).
- The prohibition against installing interior doors between individual passenger areas (§ 25.813).

Amendment 25-9 (effective 6/30/66), Revised Emergency Evacuation Rope Requirements

This amendment partially rescinded certain requirements promulgated in Amendment 25-1. In particular, the requirement was removed that each over-the-wing emergency exit have an approved means to assist occupants in descending to the ground (§ 25.809).

Amendment 25-15 (effective 10/24/67), Crashworthiness and Passenger Evacuation Standards

This amendment represents a substantial revision to the crashworthiness and passenger evacuation standards. It was promulgated to require the implementation of state of the art technology with the aim of substantially increasing the probability of occupant survival during and after an aircraft accident. This amendment:

- Adopted new head injury protection requirements for occupants of side facing seats (§ 25.785).
- Introduced Type A exits with a 100 passenger rating (§ 25.807).

- Allowed ventral and tail cone doors to be considered as passenger emergency exits (§ 25.803).
- Required uniform distribution of exits (§ 25.807).
- Required that each passenger entry door qualify as a Type A, Type I or Type II emergency exit (§ 25.783).
- Introduced the 90 second emergency evacuation requirement (§ 25.803).
- Required escape routes to be established from overwing emergency exits (§ 25.807).
- Required improved emergency egress following collapse of the landing gear (§§ 25.783, 25.809).
- Revised the ditching emergency exit requirements (§ 25.807).
- Required escape slides or equivalent assist means for passenger emergency exits (§ 25.809).
- Revised the requirements for interior and exterior emergency exit markings (§ 25.811).
- Introduced new interior and exterior emergency lighting requirements (§ 25.812).
- Upgraded the flammability standards and introduced flammability test methods in Appendix F (§ 25.853).
- Introduced special retroactive requirements (§ 25.2). The special retroactive requirements required compliance with virtually all of the changed adopted by Amendment 25-15, whenever a passenger capacity increase was sought in excess of that previously type certificated.

#### Amendment 25-17 (effective 6/20/68), Clarifications of Crashworthiness and Passenger Evacuation Standards

This amendment was promulgated to clarify certain of the provisions contained in Amendment 25-15 regarding emergency evacuation demonstrations (§ 25.803), seat-back obstruction provisions (§ 25.813) and flammability test methods for certain materials (§ 25.853). In addition, the special retroactive requirements (§ 25.2) were updated to be consistent with the clarifications promulgated by Amendment 25-17.

#### Amendment 25-20 (effective 4/23/69), Crashworthiness and Passenger Evacuation

This amendment was promulgated to amend certain occupant protection and emergency evacuation requirements. This amendment:

- Clarified the ambiguous term, “side facing seat” to be those seats which were canted more than 18 degrees with respect to a vertical plan containing the airplane centerline (§ 25.785).
- Added additional emergency exit requirements to certain sized passenger ventral and tail cone exits (§ 25.803).
- Prohibited the use of excess emergency exits during the conduct of emergency evacuation demonstrations (§ 25.803).
- Updated the special retroactive requirements (§ 25.2) to be consistent with the clarifications promulgated by Amendment 25-20.

#### Amendment 25-23 (effective 5/8/70), Improved Airworthiness Requirements

The purpose of this amendment was to implement widespread changes to improve the airworthiness type certification standards. The changes revised far more than just the

crashworthiness requirements, however, only the significant crashworthiness aspects are summarized below. This amendment:

- Clarified that the ultimate inertia forces are considered to act separately relative to the surrounding structure (§ 25.561).
- Required that each external door not open in flight as a result of a failure of any single structural element (§ 25.783).
- Clarified that a portable fire extinguisher must be conveniently located in the pilot compartment (§§ 25.853, 25.1307).

Amendment 25-28 (effective 9/25/71), Emergency Slide Lighting

This amendment was promulgated to take into account technology improvements for self-contained emergency escape slide lighting. Prior to Amendment 25-28, all of the assist means emergency lighting (typically escape slide mounted lights) were required to be controllable by the crew as part of the aircraft emergency lighting system. Amendment 25-28 recognized the acceptability of separately activated lighting systems that provided illumination for a single assist means. These types of lighting systems were allowed to be indirectly controlled by the crew, in that they were automatically illuminated upon activation of the assist means deployment system (§ 25.812).

Amendment 25-29 (effective 10/21/71), Emergency Locator Transmitters

This amendment promulgated the requirement that ditching certificated aircraft (i.e., aircraft certificated for extended overwater operations) have a survival type emergency locator transmitter available for use in one life raft (§ 25.1415).

Amendment 25-32 (effective 5/1/72), Crashworthiness and Passenger Evacuation Standards

This amendment was codified to implement improvements in the crashworthiness and emergency evacuation equipment requirements. This amendment:

- Clarified the means of protection that could be provided for occupants of forward facing seats (§ 25.785).
- Revised § 25.787 to require carry-on baggage and equipment stowage units to be placarded for their maximum stowage weight, rather than just cargo and baggage compartments, and to require that they be completely enclosed.
- Required that each item of mass that is part of the type design be prevented from becoming a hazard as a result of inertia loads (§ 25.789).
- Introduced requirements for passenger information signs (no-smoking / fasten seat belts signs) (§ 25.791).
- Established additional requirements for overwing escape routes (§ 25.803).
- Revised the requirements for passenger emergency exits, emergency exit arrangements and emergency exit markings (§§ 25.807, 25.809, 25.811).
- Provided additional requirements for emergency lighting (§ 25.812).
- Revised the emergency exit access requirements applicable to Type III and Type IV exits (§ 25.813).
- Revised § 25.853 and Appendix F to make a major improvements in the flammability characteristics of interior materials.

Amendment 25-33 (effective 10/21/72), Emergency Exit Arrangement

This amendment was promulgated during the time that airline hijackings were becoming a problem and airplane security was becoming a greater concern. This amendment sought to refine the requirements for airplanes equipped with lockable pilot compartment doors. The emergency exit configuration of the airplane had to be designed so that neither crewmembers nor passengers need to use the lockable pilot compartment door in order to reach the emergency exits provided for them (§ 25.772).

Amendment 25-34 (effective 12/31/72), Rear Exit Security

This amendment was also promulgated during the time that airline hijackings were becoming more prevalent. In response to the hijacking of a Boeing 727 by D.B. Cooper, this amendment provided additional security on certain large passenger-carrying turbojet powered airplanes by requiring that each ventral and tail cone exit be designed and constructed so that it cannot be opened during flight. As a result of these requirements, it is no longer possible to leave a hijacked aircraft in flight, using a parachute (§ 25.809).

Amendment 25-38 (effective 2/1/77), Miscellaneous Amendments

This amendment was promulgated to update and improve many of the aircraft engine and propeller certification regulations. The changes revised far more than just the crashworthiness requirements, however, only the significant crashworthiness aspects are summarized below. This amendment:

- Added new requirements for cargo compartment lamps, such that if they were installed, lamp (i.e., bulb) contact with cargo had to be prevented (§ 25.787).
- Allowed narrower main aisle widths for airplanes with passenger seating capacities of 10 or less (§ 25.815).
- Added a new requirement that protective breathing equipment be installed in each isolated separate compartment in the airplane, including upper and lower lobe galleys, in which crewmember occupancy is permitted during flight (§ 25.1439).

Amendment 25-39 (effective 2/10/77), Type A Exit Rating

This amendment revised the maximum passenger seating configuration allowed for each pair of Type A exits from 100 to 110 for the type certification of transport category airplanes (§ 25.807).

Amendment 25-41 (effective 9/1/77), Equipment and Systems Amendments

This amendment was promulgated to update and improve the airworthiness standards applicable to aircraft equipment and systems. The changes revised more than just crashworthiness related systems and equipment requirements. As such, only the significant crashworthiness related aspects are summarized below. This amendment:

- Added requirements that megaphone restraints be capable of restraining megaphones (when installed) when subjected to the ultimate inertia forces (§ 25.1421).
- Require oxygen masks to be automatically presented to all occupants, and an additional 10 percent to be distributed as uniformly as practicable throughout the cabin (§ 25.1447).

Amendment 25-44 (effective 12/4/78), Safety Belt Requirements

This amendment required that each safety belt be equipped with a metal to metal latching device (§ 25.1413).

Amendment 25-46 (effective 12/1/78), Airframe and Crashworthiness Standards

This amendment was promulgated to update and improve the airframe and crashworthiness standards. As this amendment revised more than just crashworthiness requirements, only the significant crashworthiness related aspects are summarized below. This amendment:

- Required that items of mass in galleys not become a hazard due to inertia forces (§ 25.789).
- Required that restraint systems restrain interphones under the emergency landing inertia forces (§ 25.789).
- Revised the emergency evacuation requirements to be consistent with the operations requirements, and to allow the use of analysis in lieu of an actual demonstration (§ 25.803).
- Clarified the requirements for flight attendant seats installed adjacent to Type A exits (§ 25.807).
- Added a new 25-knot wind capability requirement for slides, and required slide repeatability tests after being subjected to the emergency landing inertia forces (§ 25.809).
- Revised the emergency lighting requirements to require the illumination of operating handles for Type I and Type A exits (§ 25.811).
- Required additional emergency lighting control functionality (§ 25.812).
- Revised the emergency exit access requirements to improve the access to Type III exits on airplanes with 20 or more passenger seats (§ 25.813).
- Required that public address system microphones be positioned at each floor level exit (§ 25.1411).
- Added requirements that portable liferafts allow rapid detachment for use at other than their intended exits (§ 25.1411).
- Specified that emergency equipment stowage provisions facilitate the easy removal of the equipment (§ 25.1561).

Amendment 25-47 (effective 12/24/79), Cabin Safety and Flight Attendant Amendments

This amendment was promulgated to update and improve certain requirements applicable to airworthiness, aircraft equipment, and operations. As this amendment revised more than just crashworthiness requirements, only the significant crashworthiness related aspects are summarized below. This amendment:

- Required that a means be provided for flight crewmembers to directly enter the passenger compartment from the pilot compartment if the cockpit door becomes jammed (§ 25.772).
- Required that escape slides provide safe evacuation of occupants to the ground under all conditions of gear collapse (§ 25.809).

Amendment 25-51 (effective 3/6/80), Cabin Safety and Flight Attendant Amendments

This amendment was promulgated to incorporate upgraded cabin safety and flight attendant protection standards. This amendment:

- Provided increased protection to occupants of flight attendant seats, and included the requirement for flight attendant direct view (§ 25.785).

- Required stowage compartment latch designs to consider wear and tear deterioration to reduce the likelihood of flight attendants being struck from items becoming dislodged (§ 25.787).
- Added a new requirement that areas likely to become wet in service have slip resistant floors (§ 25.793).
- Added more stringent fire containment requirements for lavatory waste receptacles and added requirements for No Smoking placards on the outside of lavatories and waste receptacles (§ 25.853).

#### Amendment 25-52 (effective 9/9/80), Technical Standard Order (TSO) Revision Program

This amendment revised § 25.1415 to require that survival type emergency locator transmitter meet the applicable requirements of TSO-C91 rather than the requirements of revoked section 37.200.

#### Amendment 25-53 (effective 8/31/80), Operations Review Program

This amendment was promulgated to update and improve certain requirements for the certification and operation of large aircraft. As this amendment revised more than just crashworthiness requirements, only the significant crashworthiness related aspects are summarized below. This amendment:

- Introduced new requirements establishing an appropriate level of safety for occupants of lower deck service compartments and powered lift systems (§ 25.819).
- Revised the requirements for public address system microphones, such that they only need be positioned adjacent to flight attendant seats located near floor level emergency exits (§ 25.1411).

#### Amendment 25-54 (effective 10/14/80), Improved Airworthiness Standards

This amendment was promulgated to update and improve certain requirements for the airworthiness standards of large aircraft. As this amendment revised more than just crashworthiness requirements, only the significant crashworthiness related aspects are summarized below. This amendment:

- Consolidated the requirements for hand fire extinguishers (§ 25.851).
- Upgraded the certification and locking requirements for external doors (§ 25.783).
- Added lavatory door access requirements (§ 25.783).

#### Amendment 25-55 (effective 4/28/82), Miscellaneous Amendments

This amendment made minor editorial changes to Appendix F, and clarified § 25.807 to make it clear that all transport category aircraft must have ditching emergency exits, whether or not ditching certification is requested.

#### Amendment 25-58 (effective 11/26/84), Floor Proximity Emergency Escape Path Marking Systems

This amendment revised § 25.812 by adding a new paragraph (e), to require a means to locate exits in conditions when lighting above 4 feet is totally obscured. Advisory Circular (AC) 25.812-1, AC 25.812-1A and AC 25.812-2 were subsequently issued to provide guidance regarding finding compliance with the regulation, including how to conduct an evaluation using naïve participants.

#### Amendment 25-59 (effective November 26, 1984), Flammability Requirements for Aircraft Seat Cushions

This amendment established new flammability requirements for seat cushions used in Transport Category Aircraft. It revised § 25.853 by adding a requirement for seat back and bottom cushions, except those on flight crewmember seats, to meet a new flammability test using a 2 gallon/hour kerosene burner. Appendix F was also revised to add part II, which describes the test requirements.

#### Amendment 25-60 (effective 6/16/86), Fire Protection Requirements for Cargo or Baggage Compartments

This amendment established new flammability requirements for cargo compartment liners used in Transport Category Aircraft. This amendment:

- Introduced a new flammability test, part III, to Appendix F which uses the 2 gallon/hour kerosene burner (§ 25.855).
- Requires that the sidewall and ceiling panels of Class C and Class D cargo compartments meet new burn through requirements (§ 25.855).
- Limits the size of Class D compartments to 1000 cubic feet (§ 25.857).

#### Amendment 25-61 (effective 8/20/86), Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins

This amendment was promulgated to upgrade the flammability safety standards for materials used in the interiors of transport category airplane cabins, in order to increase occupant survival in the presence of an externally fed fire scenario following an airplane accident. This amendment:

- Introduced new flammability requirements applicable to large interior surfaces and panels, for aircraft with passenger capacities of 20 or more (§ 25.853).
- Describes the new test method in part IV of Appendix F, which utilized a rate-of-heat-release chamber or an OSU chamber. The latter designation is for the institution at which the test method was developed; Ohio State University.

#### Amendment 25-64 (effective 6/16/88), Improved Seat Safety Standards

This amendment upgraded the standards for occupant protection during emergency landing conditions in transport category airplanes by revising the seat restraint requirements and by defining impact injury criteria. This amendment:

- Introduced new dynamic test requirements for seats in transport category airplanes of all sizes (§ 25.562).
- Introduced new occupant protection performance measures to be met under the dynamic conditions, including head injury criterion, lumbar loads, and femur loads (§ 25.562).
- Increased the static emergency landing load requirements in the upward, sideward and downward directions, and introduced a rearward static load (§ 25.561).

Amendment 25-66 (effective 9/26/88), Improved Flammability Standards for Materials Used in the Interiors of Transport Category Airplane Cabins

This amendment was promulgated to further improve the flammability standards for materials used in the interiors of transport category airplane cabins. This amendment:

- Made refinements in the part IV test of Appendix F in order to improve the reproducibility of test results (§ 25.853).
- Added a smoke emissions test, to part V of Appendix F to minimize the possibility that emergency egress will be hampered by smoke obscuration.
- Required materials which had to comply with part IV of Appendix F (heat release) to also comply with part V of Appendix F (smoke density).

Amendment 25-67 (effective 7/24/89), Distances Between Emergency Exits

This amendment established a new standard to limit the distance between emergency exits on transport category airplanes. This amendment:

- Added a new requirement that airplanes with more than one exit on each side of the fuselage may not have adjacent passenger emergency exits more than 60 feet apart (§ 25.807).
- Revised the certification procedures in part 21 for new aircraft, preventing the issuance of a standard airworthiness certificate for transport category airplanes which do not meet the new 60-foot requirement (§ 21.183).
- Revised the special retroactive requirements to require that each applicant for a supplemental type certificate meet the new 60-foot rule requirements (§ 25.2).

Amendment 25-70 (effective 11/27/89), Independent Power Source for Public Address System in Transport Category Airplanes

This amendment was promulgated to ensure the availability of the public address (PA) system during emergency conditions. This amendment:

- Added new requirements for the accessibility of required PA systems (§ 25.1411).
- Required an independent PA system power source to ensure functionality during emergency conditions (§ 25.1423).

Amendment 25-72 (effective 8/20/1990), Special Review; Transport Category Airplane Airworthiness Standards

This amendment was promulgated to update part 25 for clarity and accuracy, and to ensure the airworthiness standards were appropriate for the smaller transport airplane common to regional air carrier operations. This amendment made editorial changes to many of the regulations pertaining to crashworthiness. However, the intent of the crashworthiness requirements remained basically unchanged. Refer to Appendix 10 for a summary of how the different sections were redesignated as a result of Amendment 25-72.

Amendment 25-74 (effective 6/16/91), Improved Cabin Fire Protection

This amendment was promulgated to improve cabin fire protection capabilities by:

- Requiring smoke detectors in each lavatory (§ 25.854).

- Requiring lavatory trash receptacles to be equipped with automatically activated fire extinguishers (§ 25.854).
- Increasing the number of required fire extinguishers for airplanes with more than 200 passengers (§ 25.851).
- Specifying a number of fire extinguishers be required to contain Halon 1211 as the extinguishing agent (§ 25.851).
- Requiring one hand fire extinguisher to be installed in, or readily accessible to each galley (§ 25.851).

#### Amendment 25-76 (effective 6/3/92), Improved Access to Type III Exits

This amendment revised the emergency exit access regulations (§ 25.813) to require improved access to Type III exits (typically smaller over-wing exits) in transport category airplanes with 60 or more passenger seats. These changes were the results of tests that were conducted at the FAA's Civil Aeromedical Institute (CAMI) and were promulgated with the intent to improve the ability of occupants to evacuate an airplane under emergency conditions.

#### Amendment 25-79 (effective 9/27/93), Miscellaneous Changes to Emergency Evacuation Demonstration Procedures, Exit Handle Illumination Requirements, and Public Address Systems

These amendments were promulgated to enhance the provisions for egress of occupants of transport category airplanes under emergency conditions. This amendment:

- Modified the procedures for conducting emergency evacuation demonstrations. This included a requirement that the flightcrew take no active role in the demonstration, and a change to the age/sex distribution requirement for demonstration participants.
- Standardized the illumination requirements for the handles of the various types of passenger emergency exits.
- Added a requirement to prevent the inadvertent disabling of the PA system because of an unstowed microphone.

#### Amendment 25-82 (effective 6/21/94), Emergency Locator Transmitters

This rule was promulgated to improve the reliability and performance of emergency locator transmitters (ELTs). The rule requires that newly installed ELTs on U.S. registered aircraft be of an improved design that meets the requirements of a revised Technical Standard Order (TSO) or later TSOs issued for ELTs (§ 25.1415).

#### Amendment 25-83 (effective 3/6/1995), Improved Flammability Standards

This rule was promulgated to clarify the standards propagated in 1986 concerning the flammability of components used in the cabins of certain transport category airplanes. The clarifications were necessary to preclude certain costly, unintended changes to airplane interiors. The resulting changes re-organized § 25.853, and made minor refinements in the test apparatus and procedures within Appendix F, Part IV, regarding rate-of-heat-release testing.

#### Amendment 25-87 (effective 7/5/96), Standards for High Altitude Operations

This rule was promulgated to specify airplane and equipment airworthiness standards for airplane to be operated up to an altitude of 51,000 feet. This rule change affected the structural requirements for high altitude aircraft and the corresponding system changes to ensure survivability following a rapid decompression at high altitudes. From a crashworthiness perspective, the regulation requires the installation of pressure demand type crew oxygen masks

for aircraft where the flightcrew may be exposed to cabin pressure altitude in excess of 34,000 feet (§ 25.1447).

Amendment 25-88 (effective 12/9/96), Type and Number of Passenger Emergency Exits

This amendment was promulgated in order to update the requirements for passenger emergency exits, and assist means. These changes allow more flexibility in the design of emergency exits and are reflective of improvements in escape slide technology. This amendment:

- Identifies two new types of passenger emergency exits (Types B and C) in transport category airplanes (§ 25.807).
- Provides more consistent standards with respect to the passenger seating allowed for each exit type and combination of exit types (§ 25.807).
- Requires escape slides to be erected in less time, thereby enabling more rapid egress of passengers under emergency conditions (§ 25.810).
- Inadvertently removed the 60-foot limitation between adjacent passenger emergency exits and the requirements for flight crew emergency exits.

Amendment 25-93 (effective 3/19/98), Revised Standards for Cargo or Baggage Compartments

This amendment upgraded the fire safety standards for cargo or baggage compartments in certain transport category airplanes. The amendment eliminated Class D compartments as an option for future type certification in order to increase protection from possible in-flight fires (§ 25.855). These upgraded requirements were the result of several in-flight fires in class D compartments, including the ValuJet Airlines DC-9 that crashed in the Florida Everglades. Compartments that were no longer allowed to be designated as Class D must meet the standards for Class C or Class E compartments, as applicable.

Amendment 25-94 (effective 3/25/98), Technical Amendments and Other Miscellaneous Corrections

This amendment corrected a number of errors in the safety standards for transport category airplanes. This amendment:

- Revised § 25.807 to reintroduce the 60-foot maximum distance between exits, and requirements for flight deck emergency exits. Both requirements were inadvertently omitted from Amendment 25-88.
- Made minor typographical corrections to cross references contained in Appendix F, Part II.

Amendment 25-99 (effective 6/10/03), Type Certification Procedures for Changed Products

This rule change is not specific to crashworthiness issues; it does however, revise the special retroactive requirements of § 25.2 as part of the Changed Product Rule.

Amendment 25-106 (effective 6/15/01), Flight Deck Door Security Considerations

This amendment was promulgated in response to the terrorist attacks of September 11, 2001. It introduced a new § 25.795, which requires means to protect the flightdeck from unauthorized intrusion, and protection from small arms fire or fragmentation devices.

Amendment 25-110 (effective 7/21/03), Lower Deck Service Compartments

This amendment was promulgated to require two-way voice communication systems between lower deck service compartments and the flightdeck remain available following loss of the normal electrical power generating system. It also clarifies the requirements for seats installed in the lower deck service compartment.

Amendment 25-111 (effective 9/02/03), Thermal/Acoustic Insulation

This amendment promulgated upgraded flammability standards for thermal and acoustic insulation materials used in transport category airplanes. These standards are intended to enhance safety by reducing the incidence and severity of cabin fires, particularly those in inaccessible areas where thermal and acoustic insulation materials are installed, and providing additional time for evacuation by delaying the entry of post-crash fires into the cabin.

Amendment 25-114 (effective 6/02/04), Design Standards for Fuselage Doors on Transport Category Airplanes

This amendment upgraded the design standards for fuselage doors, hatches, and exits on transport category airplanes. This amendment improved door integrity by providing design criteria that ensure doors remain secure under all circumstances that service experience has shown can happen. This amendment also relieved a certification burden on industry by removing regulatory differences between the airworthiness standards and related guidance material of the United States and Europe.

Amendment 25-116 (effective 11/26/04), Miscellaneous Cabin Safety Changes

This amendment revised the airworthiness standards for transport category airplanes relating to flight attendant assist spaces and handles, door hold-open features, outside viewing means, interior compartment doors, and portable oxygen equipment. It also amended the operating requirements for domestic, flag, and supplemental operations. These amendments resulted in both new type design regulations as well as retrofit requirements. In addition, several editorial changes were adopted.

Amendment 25-123 (effective 12/10/07), Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety (EAPAS/FTS)

This amendment revised the design, installation, and maintenance of airplane electrical wiring systems and aligned those requirements as closely as possible with the requirements for fuel tank system safety. Specifically for cabin safety, § 25.1365 is a new rule within the “Miscellaneous Equipment” section of subpart F concerning design and installation of domestic appliances, electrical motors, and transformers. Section 25.1365 requires that domestic appliances be designed and installed so that in the event of failures, the requirements of §§ 25.1309(b), (c), and (d) would be satisfied. It requires that galleys and cooking appliances be such as to minimize risk of overheating or fire and that they be installed to prevent damage or contamination of other equipment from fluids or vapors resulting from spillage during use of the appliances. It also requires that all electric motors and transformers be provided with a thermal protection device unless it can be shown that the circuit protective device required by § 25.1357(a) would be sufficient to show compliance with requirements of § 25.1309(b).

Amendment 25-128 (effective 5/29/09), Various Technical Amendments and Corrections

This amendment corrected a number of errors in the safety standards for transport category

airplanes. None of the changes were substantive in nature, and this amendment did not impose any additional burdens on any person affected by these regulations.

Amendment 25-142, (effective 4/18/16), Harmonization of Airworthiness Standards—Fire Extinguishers and Class B and F Cargo Compartments

This amendment upgraded fire safety standards for Class B cargo compartments; established fire safety standards for a new type of cargo compartment, Class F; and updated related standards for fire extinguishers. This amendment was based on recommendations from the Aviation Rulemaking Advisory Committee (ARAC) and the National Transportation Safety Board (NTSB), and the changes addressed designs for which airworthiness directives (ADs) have been issued by both the FAA and the French civil aviation authority, Direction Générale de l'Aviation Civile (DGAC).

This amendment also eliminated certain regulatory differences between the airworthiness standards of the FAA and the European Union Aviation Safety Agency (EASA), without affecting current industry design practices. These changes ensure an acceptable level of safety for these types of cargo compartments by standardizing certain requirements and procedures.

Amendment 25-XXX (effective mm/dd/yy), High Elevation Airport Operations

This amendment revised airworthiness regulations applicable to cabin pressurization systems and oxygen dispensing equipment on transport category airplanes, to facilitate certification of those airplanes, systems, and equipment for operation at high elevation airports. This rule eliminated the need for certain equivalent level of safety (ELOS) findings and exemptions.

Amendment 25-XXX (effective mm/dd/yy), Interior Parts and Components Fire Protection for Transport Category Airplanes

The amendment revised certain airworthiness regulations for fire protection of interior compartments on transport category airplanes. It converted those flammability regulations from detailed, prescriptive requirements into simpler, performance-based standards. It also divided the standards into two categories: those designed to protect the airplane and its occupants from the hazards of in-flight fires, and those designed to protect the airplane and its occupants from the hazards caused by post-crash fires. In addition, this amendment removed test methods from the regulations and allowed applicants, in certain cases, to demonstrate compliance either without conducting tests or by providing independent substantiation of the flammability characteristics of a proposed material. This amendment eliminated unnecessary testing, increased standardization, and improved safety. It also included conforming changes to parts 27, 29, 91, 121, 125, and 135.

Amendment 25-XXX (effective mm/dd/yy), Transport Airplane and Propulsion Certification Modernization

This amendment adds certain airworthiness regulations to enable private use and low occupancy cabin interior arrangements. This amendment adds a definition of low occupancy and provide a structured applicability of the regulations for cabin interiors. This amendment also addresses passenger seat size and spacing. This amendment incorporates relief from specific cabin interior requirements for carriage of authorized persons on cargo aircraft and the installation of medical stretchers with relief from the dynamic emergency landing conditions. This codifies commonly granted special conditions, exemptions, and findings of equivalent safety. This amendment also increases the level of harmonization with corresponding EASA Certification Specifications.

APPENDIX 16  
RECENT POLICY MEMOS AND STATEMENTS

The table below lists the policies that the FAA has issued since the last revision of this AC. For a copy of these policies, see <https://drs.faa.gov/browse>.

Policy No.	Related Regulations	Summary
ANM-115-09-017, <i>Policy Statement on Interaction of Interior Structures, Including Seats</i> , dated January 28, 2010	§§ 25.301, 25.305, 25.561, and 25.562	Provides guidance to address structural interaction of interior components, including seats.
PS-ANM-25.815-01, <i>Compliance with the Aisle Width Requirements of § 25.815</i> , dated December 17, 2012	§ 25.815	<ul style="list-style-type: none"> <li>• Supersedes Policy Memorandum 99-115-24, <i>Compliance with the Aisle Width Requirements of § 25.815</i>, dated November 24, 1999.</li> <li>• Clarifies which airplanes the policy addresses.</li> <li>• Supplements existing ACs.</li> </ul>
PS-ANM-25-03-R1, <i>Technical Criteria for Approving Side-Facing Seats</i> , dated November 5, 2012	§§ 25.562 and 25.785	<ul style="list-style-type: none"> <li>• Updates FAA certification policy on §§ 25.562 and 25.785(a) at Amendment 25-64 for single- and multiple-place side-facing seats.</li> <li>• Addresses both technical criteria for approving side-facing seats and implementation of those criteria.</li> </ul>
PS-AIR-25-27, <i>Technical Criteria for Approving Oblique Seats</i> , dated July 11, 2018	§§ 25.562 and 25.785	<ul style="list-style-type: none"> <li>• Communicates FAA certification policy on §§ 25.562 and 25.785, Amendment 25-64 or later, for side-facing seats installed at angles greater than 18° up to and including 45° from the centerline of the airplane as measured from the forward direction (oblique seats).</li> <li>• Addresses both technical criteria for certifying oblique seat designs and implementation of those criteria.</li> <li>• States seats installed at more than a 45° angle are beyond the scope of the policy.</li> </ul>