Federal Aviation Administration

Memorandum

Date:	October 17, 2008
To:	See Distribution
From:	Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100
Subject:	Policy Statement on Access to and Opening of Type III and IV Exits on Airplanes with Passenger Seating Capacities of 19 or Fewer
Memo No.:	ANM-115-08-02
Regulatory Reference:	Civil Air Regulation 4b.362, Title 14 Code of Federal Regulations (14 CFR) §§ 25.803(a), 25.809(a),(b),(c), and 25.813(c)

Summary
This policy statement provides guidance on the access and openability requirements of §§ 25.809 and 25.813(c)(2)(ii) for Type III and IV exits on transport category airplanes with 19 or fewer passenger seats.

Definition of Key Terms
In the policy statement below, the formatting (*italics*, plain text, or [square brackets]) and terms used ("must," "should," or "recommend") have a specific meaning that is explained in Attachment 1.

Current Regulatory and Advisory Material
The need to plan for emergencies has always been considered a necessary part of airplane certification. The Civil Air Regulations (CAR), which were the earliest rules governing American aviation, provided requirements to ensure rapid evacuation of an airplane in an emergency. They also provided requirements to ensure access to and opening of the airplane's exits, to ensure that rapid evacuation would be possible. Following are parts of the original CAR emergency evacuation and exit arrangement rules relevant to the access and openability of exits.

CAR 4b.362, effective December 20, 1951

Emergency Evacuation

Crew and passenger areas shall be provided with emergency evacuation means to permit rapid egress in the event of crash landings, whether with the landing gear extended or retracted, taking into account the possibility of the airplane being on fire…

CAR 4b.362(e), effective December 20, 1951

Emergency Exit Arrangement

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(1) Emergency exits shall consist of moveable doors or hatches in the external walls of the fuselage and shall provide an unobstructed opening to the outside.
(2) All emergency exits shall be openable from the inside and from the outside.
(3) The means of opening emergency exits shall be simple and obvious and shall not require exceptional effort of a person opening them.

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CAR 4b.362(g), effective April 9, 1957

… Access shall be provided from the main aisle to all Type III and Type IV exits and such access shall not be obstructed by seats, berths or other protrusions to an extent which would reduce the effectiveness of the exit, except that minor obstructions shall be permissible if the Administrator finds that compensating factors are present to maintain the effectiveness of the exit…

In 1965, the CAR 4b aircraft certification regulations were recodified into the current Title 14 Code of Federal Regulations (14 CFR) part 25. During the years between the initial recodification and now, the wording and organization of these emergency evacuation and exit access requirements have been changed somewhat, but their meaning and intent has remained the same for airplanes with passenger seating configurations of 19 or fewer. There was, however, a time requirement added to § 25.809 (the former CAR 4b.362(e)), in May, 1972. At that time, section 25.809 was revised at Amendment 25-32 to mandate that each emergency exit must be shown to be openable within 10 seconds.

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Below are the current requirements.

14 CFR 25.803, effective August 20, 1990

Emergency evacuation.

(a) Each crew and passenger area must have emergency means to allow rapid evacuation in crash landings, with the landing gear extended as well as with the landing gear retracted, considering the possibility of the airplane being on fire…..

14 CFR 25.809, effective November 16, 2004

Emergency exit arrangement.

(a) Each emergency exit, including each flightcrew emergency exit, must be a movable door or hatch in the external walls of the fuselage, allowing an unobstructed opening to the outside. …

(b) Each emergency exit must be openable from the inside and the outside except that sliding window emergency exits in the flight crew area need not be openable from the outside if other approved exits are convenient and readily accessible to the flight crew area. Each emergency exit must be capable of being opened, when there is no fuselage deformation—

(1) With the airplane in the normal ground attitude and in each of the attitudes corresponding to collapse of one or more legs of the landing gear; and

(2) Within ten seconds measured from the time when the opening means is actuated to the time when the exit is fully opened.

(3) Even though persons may be crowded against the door on the inside of the airplane.

(c) The means of opening emergency exits must be simple and obvious; may not require exceptional effort; and must be arranged and marked so that it can be readily located and operated, even in darkness. ….

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14 CFR 25.813, effective November 26, 2004

Emergency exit access.

Each required emergency exit must be accessible to the passengers and located where it will afford an effective means of evacuation.

(c) The following must be provided for each Type III or Type IV exit--

(1) There must be access from the nearest aisle to each exit.

(2) In addition to the access—

(i) For airplanes that have a passenger seating configuration of 20 or more, the projected opening of the exit provided must not be obstructed and there must be no interference in opening the exit by seats, berths, or other protrusions (including any seatback in the most adverse position) for a distance from that exit not less than the width of the narrowest passenger seat installed on the airplane.

(ii) For airplanes that have a passenger seating configuration of 19 or fewer, there may be minor obstructions in this region, if there are compensating factors to maintain the effectiveness of the exit.

Guidance for understanding the meaning of a "minor obstruction" to an exit, as that term appears in CAR 4b.362, was provided in Civil Aeronautics Manual (CAM) 4b.362-6. The guidance in CAM 4b.362-6 states:

(c) "Projection of the seat backs into the minimum required exit opening may be permitted only if the seat back can be pushed forward or aft to clear the opening with the seat occupied. The force required to push the seat back away from the opening should be as low as practicable and should not exceed a maximum of 35 pounds with the seat unoccupied. The action should not require operation of any mechanical release. A clear opening should permit the required minimum exit shape to be projected inward past the seat bottom and back cushion. Minor protrusions of the seat upholstery is acceptable if it does not interfere with exit removal and if it could be compressed without special effort by the person(s) using the exit."

(d) "Armrest, curtains, or other protuberances should not restrict the required minimum opening unless they are removed simultaneously with opening of the exit. (Note that AC 25-17 states this guidance more clearly as "Armrest, curtains, or other protuberances which are removed

simultaneously with opening of the exit are not considered to restrict the required minimum opening.")"

(e) "Berth installations, whether or not made up, should not decrease the accessibility and utility of emergency exits."

The FAA later included this information as guidance for § 25.813(c)(2) in Advisory Circular (AC) 25-17, "Transport Airplane Cabin Interiors Crashworthiness Handbook," dated July 15, 1991. That guidance remains applicable up to the current amendment of part 25 for airplanes that have a passenger seating configuration of 19 or fewer.

In AC 25-17, paragraphs 411b and 415b provide additional guidance on exit access. Pertinent parts are printed below.

411b (11) "…Seat back recline or breakover should not render the exit unopenable from either inside or outside."

411b (13) "…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 pounds distributed over 40 square inches has been found acceptable to determine if the cushion is easily compressed."

415b (3) "….Unattached (loose), soft seat back cushions on side facing divans 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. The exit signs may not be obscured. For cushions attached to the seat, a maximum of two inches of encroachment would be permitted if the cushion was readily compressible."

On October 25, 1982, in between issuance of CAM 4b.362-6 and issuance of AC 25-17, the FAA Aircraft Certification Division issued guidance on exit access and on the meaning of a minor obstruction and compensating factors. A letter from the manager of the Aircraft Certification Division at that time, entitled "Interpretation of FAR 25.813(c)," states:

"Question has arisen regarding interpretation of FAR 25.813(c)(2) and, in particular, concerning side facing divan soft seat back cushions and what constitutes minor obstructions and compensating factors.

"No protuberances should be allowed into the minimum required exit opening, except a maximum of two-inch seat cushion encroachment into the required projected exit opening, if the cushion can be readily compressed to

clear the required exit opening. Berth or divan installations, whether or not made up, should not decrease the accessibility and utility of emergency exits."

The Transport Airplane Directorate (TAD) also issued a memorandum, dated May 29, 1991, and available on the Internet at http://rgl.gov, that provides the following guidance on the same subject.

"For the smaller airplanes, there could be some minor obstructions, provided that they do not reduce the effectiveness of the exit. Throw-type pillows have frequently been used in this application, and are considered acceptable if they do not impede opening the exit. In either case however, the exit must be openable, by untrained persons, from the inside and outside.

"Interior features (galleys, closets, seats etc.) must not prevent an exit from being opened. For example, an adjustable seat that can translate into the exit opening such that the exit is not openable, is not acceptable. Procedural considerations, such as placarding the seat to be in a specific position for takeoff and landing, are not considered sufficient. Seats should have a positive design feature that prevents them from being moved into positions which render an exit unopenable."

Background and Relevant Past Practice

A survey of Aircraft Certification Offices (ACO) by the TAD Standards Staff has established that, generally, seats have been placed in their most adverse configuration and location when exits are being evaluated for openability. This is consistent with current guidance.

That survey, however, also uncovered non-standardized approaches to evaluating exit accessibility. When evaluating exit accessibility, the majority of evaluators place the seat in the most adverse position, as is done when evaluating exit openability. Some evaluators, however, place the seat in a position as noted on a placard (so-called take-off and landing position). This latter practice is not in keeping with the intent of the regulation. Section 25.813 is principally involved with ensuring that access is provided to exits (see lead-in sentence to that section). Since access to the exit is moot if the exit is incapable of being opened, prior guidance focused on openability. At the same time, it must be acknowledged that being able to open an exit, but not providing access to it does not address the safety intent of the regulation. Previous guidance that was developed presumed that sufficient access would be provided when the position of the seat in its most adverse position permitted the exit to be opened. Therefore, there was no need for explicit guidance relative to exit accessibility. Unfortunately, some designs have been found that, with the seat placed in the most adverse position, allow the exit to be opened, but do not provide access to the exit. Therefore, it is necessary to provide explicit guidance. (See Policy section.)

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Some applicants have used placards to control major obstructions that, if the placard were disregarded, would result in reduced effectiveness or even blocking of an exit. See discussion above. Major obstructions and reduced effectiveness of an exit are conditions that clearly do not comply with § 25.813(c)(ii) and its predecessor regulations (including previous § 25.813(c)(ii) amendments and CAR 4b.362(g)).

Most airplane interiors for 19 or fewer passengers are configured to transport those passengers with a high level of comfort. In some cases, however, a placarded taxi, take-off, and landing position for a seat, berth, or other protrusion results in less than the passenger comfort level desired. As an example, in one interior configuration, the taxi, take-off, and landing position requires that a seat be tracked so far forward that the occupant ends up with less knee room than a typical commercial airlines economy class seat provides. The placard requires the occupant of the seat to be in such an uncomfortable position that it is not likely that the occupant will comply. Note that FAA operating rules do not require a flight attendant to be on board an airplane carrying 19 passengers or less, so there would be no way of ensuring that seats are in the required position during taxi, takeoff, and landing.

The Transport Safety Board of Canada issued Aviation Investigation Report Number A05Q0024 on February 21, 2005. That report documents Board findings for an accident involving an airplane with 2 crewmembers and 4 passengers on board. The airplane touched down 1800 feet beyond the threshold of a runway. It continued its course until stopped by a ditch. There were two exits in the airplane—a main door exit on the left side and an overwing exit on the right. At the time of the accident, a cabinet, which was serving as an armrest for a side-facing seat, partially blocked the overwing exit. A placard indicated that the armrest/cabinet must be removed before each take-off and landing. Passengers did not follow the instructions on the placard. The report provides the following "Finding as to Risk":

> "The armrest of the side seat had not been removed as required and was blocking access to the emergency exit, which could have delayed the evacuation, with serious consequences."

In this case, the airplane occupants exited out the main door exit, the only other exit, but not without difficulty. The main door exit was difficult to open because the fuselage was bent out of shape. One passenger who tried to open the main door exit was unable to do so. This delayed the evacuation.

The following are some reasons why placards are not acceptable for ensuring access to, or openability of, Type III and IV exits:

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- Neither the airworthiness regulations (14 CFR part 25) nor the operating regulations (14 CFR parts 91 or 135) require a flight attendant for airplanes with 19 or fewer passenger seats. As a result, there are no flight attendants on board to verify that placarded instructions are followed. Even if a non-required flight attendant is on board, or a person whose job it is to provide passenger convenience/service only, passengers can still move the seats after this person has completed his/her preparatory duties.
- During a flight with less than a full passenger complement, someone may sit in a seat, move it to a comfortable position that blocks the exit, and then get up and move to another seat prior to landing. In this likely scenario, there may not be any occupant in the seat blocking the exit to read and follow the placarded instructions.
- A passenger may choose to ignore a placard because the taxi, take-off, and landing position of a seat is uncomfortable (see Relevant Past Practice above). A passenger could also forget to follow the placard, even after an announcement from the flightcrew.
- There is documented evidence of such placards being ignored and, as a result, an exit being blocked during an airplane accident (see Relevant Past Practice above).
- Airplanes with passenger seating configurations of 19 or fewer are only required to have one exit on each side of the airplane. It is very possible that the exit on one side of the airplane would be unuseable due to fire, extensive crash damage, or an obstruction outside the airplane. If placarded instructions are not carried out, resulting in the only other exit being blocked or obstructed, this could result in a significant delay in evacuating the airplane. This, in turn, could result in fatalities.

The following are some reasons why crew procedures are not an acceptable way of ensuring that interior features in the passenger cabin next to exits are in a required taxi, take-off, and landing position:

- Flightcrew should not be subjected to distractions that could diminish effective accomplishment of their duties (such as runway incursion prevention). Flightcrew procedures should not require them to ensure passenger seats or other interior features in the passenger cabin are in a required taxi, take-off, and landing position. Taxi, take-off, and landing are critical phases of flight.
- Passengers could still move seats after flightcrew procedures are accomplished.
- During a flight without a full passenger complement, someone may sit in a seat, reconfigure it to a comfortable position that blocks the exit,

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and then move to another seat prior to landing. In this scenario, a flightcrew announcement to configure that seat is not sufficient. No one is sitting in the seat next to the blocked exit. The passengers, none of whom is sitting in that seat, may not take responsibility for properly configuring a seat that is not their own.

- Passengers might ignore a flightcrew announcement to configure their seats for taxi, take-off, or landing because the required configuration is uncomfortable (see Relevant Past Practice above) or, they may simply forget to follow the instruction.

Section 25.813(c)(2)(ii) allows *"minor"* obstructions in the projected opening of Type III and IV exits on airplanes with 19 or fewer passengers. This is not allowed for airplanes with 20 or more passengers. However, this regulation states that minor obstructions are only allowed *if there are compensating factors to maintain the effectiveness of the exit.* As noted above, the FAA has issued guidance on several occasions over the last 50 years to provide a better understanding of the types of configurations that may be considered to have minor obstructions with compensating features that maintain the effectiveness of these exits. This guidance provides examples that should be used as a baseline for determining compliance. For configurations where existing guidance is not sufficient (for instance, a greater obstruction with more compensating features), certifying officials should coordinate with the Transport Standards Staff. An issue paper may need to be initiated to facilitate determination of compliance and to document acceptability of the proposed configuration.

Section 25.809 was revised at Amendment 25-32 to specify the amount of time in which each emergency exit must be capable of being opened. It states that emergency exits must be capable of being opened within 10 seconds, measured from the time when the opening means is actuated to the time when the exit is fully opened. Before Amendment 25-32, the time in which an exit must be capable of being opened had not been codified in the airworthiness regulations. The predecessor regulations to § 25.809, however, in addition to the current § 25.809, do require the means of opening emergency exits to be *simple and obvious* and to *not require exceptional effort* of a person opening them. In order to meet these pre-Amendment 25-32 requirements, emergency exits should usually be capable of being opened in 10 seconds by persons either inside or outside the airplane. Exits that take more than 10 seconds to open may be acceptable if the means of opening are simple and obvious and if it does not require exceptional effort to open the exit. Any case involving an emergency exit that takes more than 10 seconds to open should be brought to the attention of the Transport Standards Staff. Note that the time to open an exit is just one factor that should be considered in demonstrating compliance with these requirements. For example, § 25.803 provides a related, but independent, requirement that expresses the intent that the emergency means allow rapid evacuation. It states the following:

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Each crew and passenger area must have emergency means to allow rapid evacuation in crash landings, with the landing gear retracted, considering the possibility of the airplane being on fire.

Policy

The intent of this policy statement is to provide guidance for complying with Type III and Type IV exit access and openabilty requirements for transport category airplanes with 19 or fewer passenger seats. Although this policy references §§ 25.809 and 25.813(c)(2)(ii), it is also applicable to their predecessor Civil Air Regulations, as referenced above. The policy is as follows:

Crew procedures or placards that specify a required taxi, take-off, and landing configuration are not sufficient to ensure access to, or openability of, Type III and IV exits in accordance with §§ 25.809(b) and 25.813(c)(2)(ii) on airplanes with 19 or fewer passenger seats. Applicants should demonstrate compliance with these requirements with interior features, such as seats, placed in their most adverse configuration and location. For seats that translate along a track or seat pan to detent or locked positions where the seat is secured, only the detent or locked positions need to be evaluated. Similarly, for seats that swivel, only detent or locked positions need to be evaluated.

Effect of Policy

The general policy stated in this document does not constitute a new regulation. The FAA individual who implements policy should follow this policy when it is applicable to a specific project. Whenever a proposed method of compliance is outside this established policy, that individual has to coordinate it with the policy issuing office using an issue paper. Similarly, if the implementing office becomes aware of reasons that an applicant's proposal should not be approved, that office must coordinate its response with the policy issuing office.

Applicants should expect that certificating officials would consider this information when making findings of compliance relevant to new certificate actions. In addition, as with all advisory material, this statement of policy identifies one means, but not the only means, of compliance.

Implementation

This policy discusses compliance methods that should be applied to type certificate, amended type certificate, supplemental type certificate, and amended supplemental type certificate programs. These compliance methods apply to those programs with an application date that is on or after the effective date of the final policy. If the date of application precedes the effective date of the final policy, and the methods of compliance have already been coordinated with and approved by the FAA or its designee, the applicant may choose to either follow the previously acceptable methods of compliance or follow the guidance contained in this policy. Previously acceptable methods of compliance, as

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referred to here, include those documented in AC 25-17 and FAA memorandums and letters. Crew procedures or placards that specify a required taxi, take-off, and landing configuration are not considered to be previously acceptable methods of compliance.

Conclusion
Crew procedures or placards that specify a required taxi, take-off, and landing configuration are not sufficient to ensure access to, or openability of, Type III and IV exits in accordance with §§ 25.809(b) and 25.813(c)(2)(ii) on airplanes with 19 or fewer passenger seats.

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Attachment: Definition of Key Terms

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Definition of Key Terms

Table A-1 defines the use of key terms in this policy statement. The table describes the intended functional impact, and the formatting used to highlight these items.

- The term "must" refers to a regulatory requirement that is mandatory for design approval. Text communicating a requirement is in *italics*.
- The term "should" refers to instructions for a particular method of compliance. If an applicant wants to deviate from these instructions, he has to coordinate the alternate method of compliance with the Transport Standards Staff using an issue paper. There is no special text formatting used for methods of compliance.
- The term "recommend" refers to a recommended practice that is optional. Enclose recommendations in [ ] brackets.

Table A-1 Definition of Key Terms

	Regulatory Requirements	**Acceptable Methods of Compliance**	**Recommendations**
Language	Must	Should	Recommend
Format	*Italics*	Regular text (No special formatting)	[Square brackets]
Functional Impact	No Design Approval if not met	Alternative has to be approved by issue paper.	None, because it is optional

Examples from policy on Power Supply Systems for Portable Electronic Devices (PSS for PED):

- *Even though PSS for PED systems may use wiring that is produced for the consumer market, the wiring must meet the flammability requirements of § 25.869.*
- Although multiple power control switches may be used (e.g., zonal control of system power), there should be a single master switch that allows for the immediate removal of power to the entire PSS for PED
- [We recommend that you provide a means of indication to enable the cabin crew to determine which outlets are in use or which outlets are available for use.]