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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2003-14193; Notice No. 03- 01]

RIN: 2120-AH34

Design Standards for Fuselage Doors on Transport Category Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The Federal Aviation Administration (FAA) proposes to amend the design standards for fuselage doors, hatches, and exits on transport category airplanes. This action would improve door integrity by providing design criteria that would ensure that doors remain secure under all circumstances that service experience has shown can happen. Adopting this proposal also would relieve a certification burden on industry by eliminating regulatory differences between the airworthiness standards and related guidance material of the United States and Europe.

DATES: Send your comments on or before [Insert date 90 days after date of publication in the Federal Register]. April 14, 2003

ADDRESSES: Address your comments to the Docket Management System, U.S. Department of Transportation, Room Plaza 401, 400 Seventh Street, SW., Washington, DC 20590-0001. You must identify the docket number FAA-2003-14193 at the beginning of your comments, and you should submit two copies of your comments. If you wish to receive confirmation that the FAA received your comments, include a self-

addressed, stamped postcard. You also may submit comments through the Internet to: http://dms.dot.gov.

You may review the public docket containing comments to proposed regulations in person in the Dockets Office between 9:00 a.m. and 5:00 p.m., Monday through Friday, except Federal holidays. The Dockets Office is on the plaza level of the NASSIF Building at the Department of Transportation at the above address. Also, you may review public dockets on the Internet at http://dms.dot.gov.

FOR FURTHER INFORMATION CONTACT: Jeff Gardlin, Federal Aviation Administration, Airframe/Cabin Safety Branch (ANM-115), Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055-4056; telephone (425) 227-2136; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

How Do I Submit Comments to this NPRM?

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. We also invite comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written documents.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. The docket is available for public inspection before and after the comment closing date. If you wish to review the docket in person, go to the address in

the ADDRESSES section of this preamble between 9:00 a.m. and 5:00 p.m., Monday through Friday, except Federal holidays. You may also review the docket using the Internet at the web address in the ADDRESSES section.

Before acting on this proposal, we will consider all comments we receive on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change this proposal in light of the comments we receive.

If you want the FAA to acknowledge receipt of your comments on this proposal, include with your comments a pre-addressed, stamped postcard on which the docket number appears. We will stamp the date on the postcard and mail it to you.

How Can I Obtain a Copy of this NPRM?

You can get an electronic copy using the Internet by:

(1) Searching the Department of Transportation's electronic Docket Management System (DMS) web page (http://dms.dot.gov/search);

(2) Visiting the Office of Rulemaking's web page at http://www.faa.gov/avr/arm/nprm.cfm?nav=nprm or

(3) Accessing the Federal Register's web page at http://www.access.gpo.gov/su_docs/aces/aces140.html.

You can also get a copy by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW, Washington, DC 20591, or by calling (202) 267-9680. Be sure to identify the docket number, notice number, or amendment number of this rulemaking.

BACKGROUND

What Prompted this Proposed Rule?

Following a major accident in 1974, which involved the opening of a fuselage door on a transport category airplane during flight, the FAA amended the applicable safety standards to provide a higher level of safety for fuselage doors. In 1980, the FAA issued amendment 25-54 to Title 14, Code of Federal Regulations (CFR), part 25 (45 FR 60172, September 11, 1980). The objective of this amendment was to provide a level of safety in doors that would be consistent with the level of safety required for other critical systems on the airplane, such as primary flight controls. This was achieved by:

- requiring redundancy and fail-safe features in the door operating systems, and
- providing protection from anticipated human errors.

In 1989, another wide-body transport category airplane lost a lower lobe cargo door during flight, along with a portion of fuselage structure above the door. Because of this accident and other similar accidents, the Air Transport Association (ATA) of America formed an industry task force to review door designs on transport category airplanes. This group was chartered to review the design and operation of doors on the current fleet of transport airplanes, and to recommend actions that would prevent any further unintended opening of outward opening doors. The group also reviewed relevant current regulations and advisory material, and provided recommendations to the FAA for necessary rule changes. The ATA submitted its recommendations to the FAA in a report entitled, "ATA Cargo Door Task Force Final Report," dated May 15, 1991.

What NTSB Safety Recommendations are Related to this Proposed Rule?

As a result of its investigation of the airplane accidents associated with fuselage doors opening during flight, the National Transportation Safety Board (NTSB) also issued several Safety Recommendations concerning doors on transport category airplanes. The NTSB asked the FAA to consider the following recommendations:

Safety Recommendation A-89-092: "Issue an airworthiness directive to require that the manual drive units and electrical actuators for the Boeing 747 cargo doors have torque-limiting devices to ensure the lock sectors, modified in accordance with the requirements of Airworthiness Directive (AD)-88-12-04 [amendment 39-5934 (53 FR 18079, May 20, 1988)], cannot be overridden during mechanical or electrical operation of the latch cams."

Safety Recommendation A-89-093: "Issue an airworthiness directive for non-plug cargo doors on all transport category airplanes requiring the installation of positive indicators to ground personnel and flight crews confirming the actual position of both the latch cams and locks, independently."

Safety Recommendation A-89-094: "Require that fail-safe design considerations for non-plug cargo doors on present and future transport category airplanes account for conceivable human errors, in addition to electrical and mechanical malfunctions."

Safety Recommendation A-92-21: "Require that the electrical actuating system for non-plug cargo doors on transport category aircraft provide for the removal of all electrical power from circuits on the door after closure (except for any indicating circuit power necessary to provide positive indication that the door is properly latched and

locked) to eliminate the possibility of uncommanded actuator movements caused by wiring short circuits."

The FAA responded to these Safety Recommendations by issuing various airworthiness directives, applicable to the current fleet of transport category airplanes, and requiring relevant modifications and inspections of the fuselage doors.

Subsequent to the conclusion of the harmonization activity (as discussed below) that led to this proposal, the FAA received an additional safety recommendation from the NTSB, A-02-020. The NTSB recommends that the FAA "Require all newly certificated transport category airplanes [to] have a system for each emergency exit door to relieve pressure so that they can only be opened on the ground after a safe differential pressure level is attained." We have not yet determined the appropriate course of action with regard to this recommendation, and no regulatory action is being proposed at this time. However, we solicit comments on this recommendation and, if appropriate, will develop a supplemental Notice of Proposed Rulemaking to propose an additional provision addressing this issue.

What Are the Relevant Airworthiness Standards in the United States?

In the United States, the airworthiness standards for type certification of transport category airplanes are contained in Title 14, Code of Federal Regulations (CFR), part 25. Manufacturers of transport category airplanes must show that each airplane they produce of a different type design complies with the appropriate part 25 standards. These standards apply to:

- airplanes manufactured within the U.S. for use by U.S.-registered operators, and

- airplanes manufactured in other countries and imported to the U.S. under a bilateral airworthiness agreement.

What Are the Relevant Airworthiness Standards in Europe?

In Europe, the airworthiness standards for type certification of transport category airplanes are contained in Joint Aviation Requirements (JAR)-25, which are based on part 25. These were developed by the Joint Aviation Authorities (JAA) of Europe to provide a common set of airworthiness standards within the European aviation community. Twenty-three European countries accept airplanes type certificated to the JAR-25 standards, including airplanes manufactured in the U.S. that are type certificated to JAR-25 standards for export to Europe.

What is "Harmonization" and How Did it Start?

Although part 25 and JAR-25 are very similar, they are not identical in every respect. When airplanes are type certificated to both sets of standards, the differences between part 25 and JAR-25 can result in substantial additional costs to manufacturers and operators. These additional costs, however, frequently do not bring about an increase in safety. In many cases, part 25 and JAR-25 may contain different requirements to accomplish the same safety intent. Consequently, manufacturers are usually burdened with meeting the requirements of both sets of standards, although the level of safety is not increased correspondingly.

Recognizing that a common set of standards would not only benefit the aviation industry economically, but also maintain the necessary high level of safety, the FAA and the JAA began an effort in 1988 to "harmonize" their respective aviation standards. The goal of the harmonization effort is to ensure that:

- where possible, standards do not require domestic and foreign parties to manufacture or operate to different standards for each country involved; and
- the standards adopted are mutually acceptable to the FAA and the foreign aviation authorities.

The FAA and JAA have identified a number of significant regulatory differences (SRD) between the wording of part 25 and JAR-25. Both the FAA and the JAA consider "harmonization" of the two sets of standards a high priority.

What is ARAC and What Role Does it Play in Harmonization?

After initiating the first steps towards harmonization, the FAA and JAA soon realized that traditional methods of rulemaking and accommodating different administrative procedures was neither sufficient nor adequate to make appreciable progress towards fulfilling the goal of harmonization. The FAA identified the Aviation Rulemaking Advisory Committee (ARAC) as an ideal vehicle for assisting in resolving harmonization issues, and, in 1992, the FAA tasked ARAC to undertake the entire harmonization effort.

The FAA had formally established ARAC in 1991 (56 FR 2190, January 22, 1991), to provide advice and recommendations concerning the full range of the FAA's safety-related rulemaking activity. The FAA sought this advice to develop better rules in less overall time and using fewer FAA resources than previously needed. The committee provides the FAA firsthand information and insight from interested parties regarding potential new rules or revisions of existing rules.

There are 74 member organizations on the committee, representing a wide range of interests within the aviation community. Meetings of the committee are open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act.

The ARAC establishes working groups to develop recommendations for resolving specific airworthiness issues. Tasks assigned to working groups are published in the Federal Register. Although working group meetings are not generally open to the public, the FAA solicits participation in working groups from interested members of the public who possess knowledge or experience in the task areas. Working groups report directly to the ARAC, and the ARAC must accept a working group proposal before ARAC presents the proposal to the FAA as an advisory committee recommendation.

The activities of the ARAC will not, however, circumvent the public rulemaking procedures; nor is the FAA limited to the rule language "recommended" by ARAC. If the FAA accepts an ARAC recommendation, the agency proceeds with the normal public rulemaking procedures. Any ARAC participation in a rulemaking package is fully disclosed in the public docket.

Under this program, the FAA provides ARAC with an opportunity to review, discuss, and comment on the FAA's draft NPRM. In the case of this rulemaking, ARAC concurred with the draft NPRM, without changes.

DISCUSSION OF THE PROPOSAL

What is the General Scope of the Proposal?

The scope of this proposal is to revise and reorganize the existing rules in 14 CFR part 25 to provide the following:

1. Clarification of the existing design requirements for doors.

2. Definitive criteria for the door design requirements that are covered in the existing rules by general text.

3. Additional fail-safe requirements and detailed door design requirements, based on the recommendations of the NTSB and the ATA, and on current industry practice.

What Definitions Apply to the Proposed Rule?

To understand the rest of this proposal, the following definitions are helpful:

A latch is a movable mechanical element that, when engaged, prevents the door from opening.

A lock is a mechanical element that monitors the latch position and, when engaged, prevents the latch from becoming disengaged.

Latched means the latches are fully engaged with their structural counterparts and held in position by the latch operating mechanism.

Locked means the locks are fully engaged.

Latching mechanism includes the latch operating mechanism and the latches.

Locking mechanism includes the lock operating mechanism and the locks.

Closed means the door has been placed within the doorframe in such a position that the latches can be operated to the "latched" condition.

Fully closed means the door is placed within the doorframe in the position that it will occupy when the latches are in the latched condition.

What are the Specific Proposed Changes?

This action proposes changes mainly to § 25.783, "Doors." First, the title of § 25.783 would be changed from the current "Doors" to "Fuselage doors" to more

accurately reflect the applicability of this revised section. The term "doors," as used in this proposed revision of § 25.783, would also include hatches, openable windows, access panels, covers, etc., on the exterior of the fuselage that do not require the use of tools to open or close. This also would include each door or hatch through a pressure bulkhead, including any bulkhead that is specifically designed to function as a secondary pressure bulkhead under the prescribed failure conditions of 14 CFR part 25.

Other specific changes to § 25.783 are as follows:

Proposed Changes to § 25.783(a)

The format and portions of the text of paragraph (a) would be totally revised. The proposed text would describe the types of doors to which this section of the regulations is applicable, and would clarify the fact that the requirements apply to the unpressurized portions of flight as well as to pressurized flight.

Proposed paragraph (a) also would provide the general design requirements for doors. These general design requirements are not substantively different from the requirements contained in existing § 25.783. A reference to the locking requirements in § 25.607 ("Fasteners") would be included in paragraph (a). Experience has shown that it is advisable to add this reference to ensure that these requirements are not overlooked during the door design process. One provision of this proposed requirement, which is new, would require the removal of all power that could initiate the unlatching and unlocking of the door during flight. It is based on NTSB Safety Recommendation A-92-21, discussed previously.

Proposed Changes to § 25.783(b)

Paragraph (b) would be revised to require safeguards against both inadvertent and deliberate opening of doors during flight. It would clarify the existing requirement that doors must be prevented from opening inadvertently (that is, not deliberately, and without forethought, consideration, or consultation) by people on board the airplane during flight. The intent of this requirement is to protect both the passenger and the airplane from hazards resulting from the unintentional actions by persons on board.

In addition, the proposal would make it clear that the door must be safeguarded against the deliberate opening during flight by persons on board. The proposed text requires that the possibility of deliberate opening be minimized. The intent of this requirement is that, for doors in pressurized compartments, it should not be possible to open the doors after takeoff, when the compartment is pressured to a significant level. (During approach, takeoff, and landing when compartment differential pressure is lower, intentional opening may be possible; however, during these short phases of the flight, all passengers are expected to be seated with seat belts fastened. The exposure to deliberate opening would therefore be minimized.) Further guidance on this subject is given in draft Advisory Circular 25.783-1X, discussed later in this document.

Further, for doors that can be opened under significant cabin pressure, or for doors in non-pressurized airplanes, the use of an auxiliary securing means, such as speed-activated or barometrically-activated devices, may be necessary. Paragraph (b) would require that, if auxiliary devices are used, they must be designed so no single failure or malfunction could prevent more than one exit from opening. Past interpretations of

existing paragraph (f) have resulted in this type of design requirement being applied to type certification projects.

Proposed Changes to 25.783(c)

Paragraph (c) would restate the existing requirements of paragraph (f) for a provision to prevent the airplane from becoming pressurized if the door is not fully closed, latched, and locked. The current requirement states:

> "External doors must have provisions to prevent the initiation of pressurization of the airplane to an unsafe level if the door is not fully closed and locked . . . ."

However, this proposal would remove the phrase, "the initiation of" from this text because it is inconsistent and confusing with regard to a common method of preventing pressurization that employs vent doors. Mechanical vent doors allow the pressurization system to initiate and a small amount of pressure may exist as the air flows through the vents. The revised text would correct this inconsistency. It also would allow for certain types of doors that:

- can safely and reliably act as their own venting mechanism when not fully closed and latched; or
- would automatically close and latch, as appropriate to the door design, before an unsafe level of pressure is reached.

For these doors without an independent means, the assessment for a safe and reliable closing would include consideration of single failures and adverse conditions, such as debris in the doorway.

Paragraph (c)(1) would provide a definitive criterion for the reliability level of the pressurization prevention system and would read: "The provision must be designed to function after any single failure, or after any combination of failures not shown to be extremely improbable." This criterion is consistent with:

- the interpretation of the general text of the existing rule, and
- the current industry practice for new designs.

The FAA does not intend that the proposed criterion impose a new level of reliability for mechanical vent systems that is more stringent than that established by typical fail-safe designs. However, it would provide a definitive criterion for use in evaluating these vent systems or other systems that may interconnect with the airplane's pressurization system. A means for preventing pressurization that functions with a high degree of reliability despite operator and flightcrew errors would be consistent with NTSB Safety Recommendation A-89-094, described previously, which recommends fail-safe features that account for conceivable human errors.

Paragraph (c)(2) would exempt certain doors that meet the requirements of proposed paragraph (h) from the requirement to have a separate means to prevent pressurization. Generally such doors would have to either remain open, so that pressurization cannot take place, or must close and latch as pressurization takes place. Under this provision, these doors would have to be shown not to create a hazardous condition, assuming single failures in the latching mechanism as well as jams due to failures or debris. This would have to be shown from every possible position during the pressurization process. This proposal formalizes and standardizes previous equivalent level of safety findings made under the provisions of § 21.21(b)(1).

Proposed Changes to § 25.783(d)

Paragraph (d) would provide requirements for the detail design and fail-safe features of latching and locking mechanisms. Advisory Circular (AC) 25.783-1 "Fuselage Doors, Hatches, and Exits," dated December 10, 1986, currently recommends some of these design features; the proposed rule would make these features mandatory.

The detail design requirements for latches and locks contained in this proposal are consistent with current industry practice, as applied to doors whose initial movement is not inward. However, the applicability of the proposed requirement would be extended to any door, regardless of the direction of initial movement.

Paragraph (d) also would require the latching mechanism to be designed to eliminate forces that would drive the latches to the open position. However, the FAA recognizes there still may be ratcheting forces that could progressively move the latches to the unlatched position. Therefore, the rule also would require the latching system to be designed such that the latches are positively secured without regard to the position of the locks.

Proposed paragraph (d)(3)(iii) contains the requirement for a fail-safe criterion for the locking system that would apply only to outward opening doors while under pressure. Since all the locks are usually designed as a single locking system, it is possible that single failures in the locking system could result in the unlocking of several or all the latches. Although the latches would continue to be held in the latched position by the latch system securing means, the FAA has determined that, for the most critical designs, during pressurized flight, single failures in the locking system should not unlock more latches than are needed to restrain the door.

Proposed paragraphs (d)(5) and (6) contain detail requirements for the lock elements and locking system to ensure that they will restrain the latches under anticipated loading conditions, and to ensure that the locks cannot be engaged unless the door is properly latched. Experience has shown these features to be fundamental to the design of a safe door.

Finally, proposed paragraph (d)(7) would exclude the requirement for a locking system from any door for which unlatching was not a hazard. In that case, a locking mechanism would not add to the safety of the door, since unlatching (which is what a locking mechanism is supposed to prevent) does not create a hazardous condition.

Proposed Changes to § 25.783(e)

Paragraph (e) would require warning, caution, and advisory indications for doors. These requirements for indication are similar to the current provisions for indication of door status in this section, but provide added features consistent with NTSB and ATA recommendations. The prescribed "improbable" level for an erroneous indication that the door is fully closed, latched, and locked is proposed to be the same as the requirement of existing paragraph (e). However, the applicability would be extended to each door, if unlatching of the door in flight could be a hazard.

Paragraph (e) also would require an aural warning before takeoff for any door that is not fully closed, latched, and locked if opening of the door would not allow safe flight. The FAA has determined that this requirement is necessary, based on service history, including the crash of an airplane shortly after takeoff as a result of aerodynamic interference from an open cargo door. This system should function in a manner similar to

the takeoff configuration warning systems required by § 25.703 ("Takeoff warning system").

Paragraph (e) also would require that there be a positive means to display indications and signals to the door operator. This proposed requirement is consistent with NTSB Safety Recommendation A-89-093, discussed previously.

Proposed Changes to § 25.783(f)

This proposal would revise paragraph (f) to require a provision for direct visual inspections to determine that the door is fully closed, latched, and locked. The specific location and quantity of the viewing means would depend on the specific design, but might not require a viewing means for each lock, provided that the number of visual indicators provided would not give a false indication. This proposed requirement is similar to that of the existing paragraph (b), which requires a means for direct visual inspection of the locking mechanism. However, this proposal would extend the requirements to apply to any door, irrespective of the direction of initial movement, if the unlatched door could be a safety hazard.

Proposed Changes to § 25.783(g)

This proposal would revise paragraph (g) to provide relief from certain requirements of the current rule that are applicable to access panels not subject to pressurization and for which opening would be inconsequential to safety. In addition, the proposal would provide relief from certain of the current requirements applicable to:

- maintenance doors that are not a safety hazard if opened; and

- removable emergency exits, because they are not used in normal operation and therefore not subjected to the same level of human error, abuse, and damage as other doors and hatches.

Proposed Changes to § 25.783(h)

Paragraph (h) would prescribe detail design features that a door would need to have if it were to be considered as a door that is "not a hazard" when this phrase is used in other paragraphs of § 25.783. This paragraph effectively defines the criteria under which a door could become a potential hazard. The criteria include hazards due to decompression, aerodynamic interference, interaction with other systems or structure (for example, through the door departing the airplane and impacting an engine or control surface). For the purposes of this determination, opening by persons is treated separately from the tendency of the door to remain closed when under pressure. However, both are considerations that must be satisfied to determine that the door is not a hazard.

Proposed Changes to § 25.783(i)

The current requirements of paragraph (i) that apply to the design of air stairs (integral stair installed in a passenger entry door that is qualified as a passenger emergency exit) would be removed from existing § 25.783 and added in § 25.810 ("Emergency egress assist means and escape routes") as a new paragraph (e), without change in text. The FAA considers that manufacturers, applicants, and others seeking compliance with rules would be better served by having these requirements located in the same section of the rules where other related requirements are found.

Proposed Changes to § 25.783(j)

The special requirement for lavatory doors contained in current paragraph (j) would be removed and placed in a new § 25.820 ("Lavatory doors"), with only minor editorial changes in text. The FAA considers that less confusion will be caused, and the regulated public will be better served, if all requirements about this particular subject are located in one separate place.

Other Proposed Changes

Several other provisions currently in § 25.783 would be deleted, since they duplicate the requirements applicable to emergency exit design that are contained in, or would be moved without substantive change to, other sections of part 25. The FAA considers that less confusion would be caused, and that the regulated public would be better served, if all requirements concerning a particular subject are located in one place. The FAA proposes the following specific changes:

§ 25.809(b) ("Emergency exit arrangement"): This paragraph would be revised by adding a new paragraph (b)(3) to require that each emergency exit must be capable of being opened, when there is no fuselage deformation, "even though persons may be crowded against the door on the inside of the airplane." This specific requirement is currently a part of § 25.783(b), but is more appropriate as part of the emergency exit arrangement requirements of § 25.809.

§ 25.809(c): This paragraph would be revised to include the requirement that the means of opening emergency exits also must be marked so it can be readily located and operated, even in darkness. This requirement is currently located in § 25.783(b), but is more appropriate as part of the emergency exit arrangement requirements of § 25.809.

§ 25.809(f): This paragraph would be revised to require that the external door be located where persons using it will not be endangered by the propellers when appropriate operating procedures are used. This requirement currently is found in § 25.783(d), but is more applicable to the emergency exit arrangement requirements of § 25.809. Existing § 25.809(f) is redundant with the requirements for locking mechanisms contained in § 25.783.

In addition, the FAA is also proposing to correct an error in the current regulations as follows:

§ 25.807 ("Emergency exits"): Existing § 25.783 requires that passenger entry doors also meet the airworthiness standards required for emergency exits. In addition, the current JAR 25.807, issued by the European JAA, requires that certain other fuselage doors, as well as passenger entry doors, meet the same standards as emergency exits. Before the adoption of Amendment 25-88 (61 FR 57956, November 8, 1996), part 25 also contained a requirement similar to that of JAR 25.807; however, that requirement was unintentionally omitted when Amendment 25-88 was adopted. This proposed rule would correct this discrepancy by setting forth this requirement in a revised § 25.807(h), and by revising § 25.783 to refer to that section.

Specifically, the proposed § 25.807(h) would be revised to refer to "other exits" that must meet the applicable emergency exit requirements of §§ 25.809 through 25.812. Those exits include:

- each emergency exit in the passenger compartment in excess of the minimum number of required emergency exits;

- floor-level doors or exits that are accessible from the passenger compartment and larger than a Type II exit, but less than 46 inches wide; and
- other ventral or tail cone passenger exits.

This provision is intended to address doors or other means of egress accessible from the passenger cabin. The width limit of 46 inches was derived from cargo doors that have been installed in smaller transport category airplanes. That is, cargo doors are not required to be exits. However, this provision does not relieve any emergency exit for which passenger credit is received from any of the applicable requirements.

Is Existing FAA Advisory Material Adequate?

The FAA also proposes to revise AC 25.783-1. The revised AC would describe an acceptable means, but not the only means, for complying with the proposed revised regulations described in this NPRM. The AC would provide guidance for showing compliance with structural and functional safety standards for doors and their operating systems. The availability of the proposed AC revision for public comment will be announced in the Federal Register in the near future.

What Regulatory Analyses and Assessments Has the FAA Conducted?

Regulatory Evaluation Summary

Proposed changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic effect of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. section 2531-2533) prohibits agencies from setting standards

that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act also requires the consideration of international standards and, where appropriate, that they be the basis of U.S. standards. And fourth, the Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector of $100 million or more annually (adjusted for inflation).

The FAA has determined that this proposal has minimal costs, and that it is neither "a significant regulatory action" as defined in Executive Order 12866, nor "significant" as defined in DOT's Regulatory Policies and Procedures. Further, this proposed rule would not have a significant economic impact on a substantial number of small entities, would reduce barriers to international trade, and would not impose an Unfunded Mandate on state, local, or tribal governments, or on the private sector.

The DOT Order 2100.5 prescribes policies and procedures for simplification, analysis, and review of regulations. If it is determined that the expected impact is so minimal that the proposed rule does not warrant a full evaluation, a statement to that effect and the basis for it is included in the proposed regulation. Accordingly, the FAA has determined that the expected impact of this proposed rule is so minimal that the proposed rule does not warrant a full evaluation. We provide the basis for this determination as follows.

Currently, airplane manufacturers must satisfy both part 25 and the European JAR-25 standards to certificate transport category aircraft in both the United States and

Europe. Meeting two sets of certification requirements raises the cost of developing a new transport category airplane often with no increase in safety. In the interest of fostering international trade, lowering the cost of aircraft development, and making the certification process more efficient, the FAA, JAA, and aircraft manufacturers have been working to create, to the maximum possible extent, a single set of certification requirements accepted in both the United States and Europe. As explained in detail previously, these efforts are referred to as "harmonization."

The proposed rule would amend the current fuselage door standard contained in 14 CFR part 25 with a new improved door standard. This new standard would set forth, as a regulatory requirement, some of the existing technical guidance criteria that have been determined to be necessary for safety but which, up to this point, have not been included in the regulations. In addition, the proposed rule addresses recommendations from the NTSB and the Air Transport Association (ATA) task force on doors.

If adopted, the proposal would harmonize the FAA and JAA requirements for fuselage doors. Adopting this proposal would also relieve a certification burden on industry by eliminating regulatory differences between the airworthiness standards and related guidance material of the United States and Europe.

Costs of the Proposed Rule

The FAA identified only one section, 25.783(b), of the proposed rule where manufacturers indicated that a measurable cost would exist. For the other proposed changes, the FAA has not made specific cost estimates but has provided qualitative cost indications.

1. Paragraph 25.783(a) is descriptive and has no expected cost.

2. Paragraph 25.783(b) relates to opening by persons. The requirement to consider deliberate opening is new, but is expected to be accommodated in existing design practices for all but one United States manufacturer. (Requirements regarding inadvertent opening are not new). One manufacturer would incur an estimated cost of $0.75 million, which would include the requirements for the prevention of intentional opening of the doors.

3. Paragraph 25.783(c) covers means to prevent pressurization. The requirement to consider single failures in the pressurization-inhibit system is new, but is believed to be industry practice. Thus, there is likely to be very little, if any, cost for a new design. The provision to permit certain doors to forego this system is actually cost-relieving, and could result in a minor cost reduction in some cases.

4. Paragraph 25.783(d) covers latching and locking. Most of these changes are the incorporation of recommendations currently contained in an advisory circular. The vast majority of airplanes already comply, and basic design practice is to comply with these requirements. Therefore, these requirements, while new, should have minimal cost impact. The requirement for each latch to have a lock, which must monitor the latch position, is a formalization of existing practice. The requirement to eliminate forces in the latching mechanism that could load the locks is new, and may not be complied with in all cases currently . The FAA believes that these costs are minimal.

5. Paragraph 25.783(e) covers warning, caution, and advisory indications. The reliability of the door indication system would be required to be higher for all doors. This would have only a small cost impact, as would the requirement for an aural warning for certain doors, and the requirement to provide an indication to the door operator.

6. Paragraph 25.783(f) contains the visual inspection provision requirement. The requirement for direct visual inspection is extended to more door types, and may add costs in some cases.

7. Paragraph 25.783(g) deals with certain maintenance doors, removable emergency exits, and access panels. The current rule does not provide the relief that the proposed rule does, although the AC has indicated that relief is possible. This provision could reduce costs in some cases.

8. Paragraph 25.783(h) covers doors that are not a hazard and is intended to provide relief for certain doors, so it could reduce costs.

9. Paragraphs 25.783(i), 25.783(j), 25.809(b), 25.809(c), and 25.809(f) move text to another section.

10. Paragraph 25.807 simply corrects an unintended deletion.

Summary of Benefit and Cost Considerations.

The proposed rule is expected to:

- maintain or provide a slight increase in the level of safety,
- have only a relatively small effect on costs when compared to current industry practice, and
- provide some cost savings to manufacturers by avoiding duplicative testing and reporting that could result from the existence of differing requirements under the current standards.

This rule would codify existing guidance, standard industry practice, and industry recommendations for the design standards for fuselage doors, which would prevent a reoccurrence of the 1974 accident. The FAA believes that the cost savings from a single

certification requirement exceed the minimal additional compliance cost. The FAA therefore considers that the proposed rule would be cost-beneficial. This is reinforced by industry's support for the proposal. We invite comments on the effects of this proposed regulation. We would particularly appreciate relevant quantitative data relating to any additional costs (or reductions in costs) believed likely to result from the proposed rule. The costs of interest are the increases or decreases, compared to costs associated with what is believed likely to be industry practice in the absence of the proposed rule.

Initial Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980, 50 U.S.C. 601-612, as amended, establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including businesses and governments.

Agencies must perform a review to determine whether a proposed or final rule will have a significant impact on a substantial number of small entities. If the determination is that the rule will, the Agency must prepare a regulatory flexibility analysis as described in the RFA.

If, however, an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the RFA provides that the head of the agency may so certify and a regulatory

flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

The FAA considers that this proposed rule would not have a significant impact on a substantial number of small entities for two reasons:

First, the proposed rule is expected to provide relief from some regulatory costs. The proposed rule would require that manufacturers of transport category aircraft meet a single certification requirement, rather than different standards for the United States and Europe. Manufacturers of the affected airplanes are believed to already meet most standards that would be required by the proposed rule, or expect to meet most of these standards.

Second, all affected U.S. transport-aircraft category manufacturers exceed the Small Business Administration small-entity criterion of 1,500 employees for aircraft manufacturers, as published by the Small Business Administration in 13 CFR part 121, Small Business Size Regulations; Size Standards, (65 FR 53533, September 5, 2000). The current U.S. part 25 airplane manufacturers include: Boeing, Cessna Aircraft, Gulfstream Aerospace, Learjet (owned by Bombardier), Lockheed Martin, McDonnell Douglas (a wholly-owned subsidiary of The Boeing Company), Raytheon Aircraft, and Sabreliner Corporation. All of these manufacturers have more than 1,500 employees and therefore do not qualify as small entities.

Since there are no affected small entity manufacturers of the airplanes covered by the proposed rule, the FAA certifies that this proposed rule would not have a significant economic impact on a substantial number of small entities.

International Trade Impact Assessment

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

In accordance with the above statute, the FAA has assessed the potential effect of this proposed rule and has determined that it would reduce trade barriers by narrowing the differences between U.S. standards and European international standards.

Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), codified in 2 U.S.C. 1532-1538, enacted as Public Law 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year.

This proposed rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million in any year; therefore, the requirements of the Act do not apply.

What Other Assessments Has the FAA Conducted?

Executive Order 13132, Federalism

The FAA has analyzed this proposed rule under the principles and criteria of Executive Order 13132, Federalism. We determined that this action would not have a

substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. We therefore determined that this notice of proposed rulemaking would not have federalism implications.

Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. We have determined that there are no new information collection requirements associated with this proposed rule.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is the FAA's policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. We have determined that there are no ICAO Standards and Recommended Practices that correspond to this proposed regulation.

Environmental Analysis

FAA Order 1050.1D defines the FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental impact statement. In accordance with the FAA Order 1050.1D, appendix 4, paragraph 4(j), this proposed rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the proposed rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94-163, as amended (43

U.S.C. 6362), and the FAA Order 1053.1. It has been determined that it is not a major regulatory action under the provisions of the EPCA.

Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in Title 14 of the CFR in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish such regulatory distinctions as he or she considers appropriate. Because this proposed rule would apply to the certification of future designs of transport category airplanes and their subsequent operation, it could, if adopted, affect intrastate aviation in Alaska. The FAA therefore specifically requests comments on whether there is justification for applying the proposed rule differently to intrastate operations in Alaska.

Plain Language

In response to the June 1, 1998, Presidential memorandum regarding the issue of plain language, the FAA re-examined the writing style currently used in the development of regulations. The memorandum requires Federal agencies to communicate clearly with the public. We are interested in your comments on whether the style of this document is clear, and in any other suggestions you might have to improve the clarity of FAA communications that affect you. You can get more information about the Presidential memorandum and the plain language initiative at http://www.plainlanguage.gov.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Recording and recordkeeping requirements.

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend part 25 of Title 14, Code of Federal Regulations, as follows:

PART 25--AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, and 44704.

2. ~~Amend~~ Section § 25.783 ~~by revising the title and text~~ is revised to read as follows: BF 1-9-03

§ 25.783 Fuselage doors.

(a) General. This section applies to fuselage doors, which includes all doors, hatches, openable windows, access panels, covers, etc., on the exterior of the fuselage that do not require the use of tools to open or close. This also applies to each door or hatch through a pressure bulkhead, including any bulkhead that is specifically designed to function as a secondary bulkhead under the prescribed failure conditions of part 25. These doors must meet the requirements of this section, taking into account both pressurized and unpressurized flight, and must be designed as follows:

(1) Each door must have means to safeguard against opening in flight as a result of mechanical failure, or failure of each single structural element.

(2) Each door that could be a hazard if it unlatches must be designed so that opening during pressurized and unpressurized flight from the fully closed, latched, and locked condition is extremely improbable. This must be shown by safety analysis.

(3) Each element of each door operating system must be designed or, where impracticable, distinctively and permanently marked, to minimize the probability of incorrect assembly and adjustment that could result in a malfunction.

(4) All sources of power that could initiate unlocking or unlatching of each door must be automatically isolated from the latching and locking systems prior to flight and it must not be possible to restore power to the door during flight.

(5) Each removable bolt, screw, nut, pin, or other removable fastener must meet the locking requirements of § 25.607.

(6) Certain doors, as specified by § 25.807(h), must also meet the applicable requirements of §§ 25.809 through 25.812 for emergency exits.

(b) Opening by persons. There must be a means to safeguard each door against opening during flight due to inadvertent action by persons. In addition, design precautions must be taken to minimize the possibility for a person to open a door intentionally during flight. If these precautions include the use of auxiliary devices, those devices and their controlling systems must be designed so that:

(1) no single failure will prevent more than one exit from being opened, and

(2) failures that would prevent opening of the exit after landing are improbable.

(c) Pressurization prevention means. There must be a provision to prevent pressurization of the airplane to an unsafe level if any door subject to pressurization is not fully closed, latched, and locked.

(1) The provision must be designed to function after any single failure, or after any combination of failures not shown to be extremely improbable.

(2) Doors that meet the conditions described in paragraph (h) of this section are not required to have a dedicated pressurization prevention means if, from every possible position of the door, it will remain open to the extent that it prevents pressurization or safely close and latch as pressurization takes place. This must also be shown with each single failure and malfunction, except that:

(i) with failures or malfunctions in the latching mechanism, it need not latch after closing, and

(ii) with jamming as a result of mechanical failure or blocking debris, the door need not close and latch if it can be shown that the pressurization loads on the jammed door or mechanism would not result in an unsafe condition.

(d) Latching and locking. The latching and locking mechanisms must be designed as follows:

(1) There must be a provision to latch each door.

(2) The latches and their operating mechanism must be designed so that, under all airplane flight and ground loading conditions, with the door latched, there is no force or torque tending to unlatch the latches. In addition, the latching system must include a means to secure the latches in the latched position. This means must be independent of the locking system.

(3) Each door subject to pressurization, and for which the initial opening movement is not inward, must --

(i) have an individual lock for each latch,

(ii) have the lock located as close as practicable to the latch, and

(iii) be designed so that, during pressurized flight, no single failure in the locking system would prevent the locks from restraining the latches as necessary to secure the door.

(4) Each door for which the initial opening movement is inward, and unlatching of the door could result in a hazard, must have a locking means to prevent the latches from becoming disengaged. The locking means must ensure sufficient latching to prevent opening of the door even with a single failure of the latching mechanism.

(5) It must not be possible to position the lock in the locked position if the latch and the latching mechanism are not in the latched position.

(6) It must not be possible to unlatch the latches with the locks in the locked position. Locks must be designed to withstand the limit loads resulting from --

(i) the maximum operator effort when the latches are operated manually;

(ii) the powered latch actuators, if installed; and

(iii) the relative motion between the latch and the structural counterpart.

(7) Each door for which unlatching would not result in a hazard is not required to have a locking mechanism meeting the requirements of paragraphs (d)(3) through (d)(6) of this section.

(e) Warning, caution, and advisory indications. Doors must be provided with the following indications:

(1) There must be a positive means to indicate at the door operator's station for each door that all required operations to close, latch, and lock the door have been completed.

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

(3) There must be a visual means on the flight deck to signal the pilots if any door is not fully closed, latched, and locked. The means must be designed such that any failure or combination of failures that would result in an erroneous closed, latched, and locked indication is improbable for —

(i) each door that is subject to pressurization and for which the initial opening movement is not inward, or

(ii) each door that could be a hazard if unlatched.

(4) There must be an aural warning to the pilots prior to or during the initial portion of takeoff roll if any door is not fully closed, latched, and locked, and its opening would prevent a safe takeoff and return to landing.

(f) Visual inspection provision. Each door for which unlatching could be a hazard must have a provision for direct visual inspection to determine, without ambiguity, if the door is fully closed, latched, and locked. The provision must be permanent and discernible under operational lighting conditions, or by means of a flashlight or equivalent light source.

(g) Certain maintenance doors, removable emergency exits, and access panels. Some doors not normally opened except for maintenance purposes or

emergency evacuation and some access panels need not comply with certain paragraphs of this section as follows:

(1) Access panels that are not subject to cabin pressurization and would not be a hazard if open during flight need not comply with paragraphs (a) through (f) of this section, but must have a means to prevent inadvertent opening during flight.

(2) Inward-opening removable emergency exits that are not normally removed, except for maintenance purposes or emergency evacuation, and flight deck-openable windows need not comply with paragraphs (c) and (f) of this section.

(3) Maintenance doors that meet the conditions of paragraph (h) of this section, and for which a placard is provided limiting use to maintenance access, need not comply with paragraphs (c) and (f) of this section.

(h) Doors that are not a hazard. For the purposes of this section, a door is considered not to be a hazard in the unlatched condition during flight, provided it can be shown to meet all of the following conditions:

(1) Doors in pressurized compartments would remain in the fully closed position if not restrained by the latches when subject to a pressure greater than 1/2 psi. Opening by persons, either inadvertently or intentionally, need not be considered in making this determination.

(2) The door would remain inside the airplane or remain attached to the airplane if it opens either in pressurized or unpressurized portions of the flight. This determination must include the consideration of inadvertent and intentional opening by persons during either pressurized or unpressurized portions of the flight.

(3) The disengagement of the latches during flight would not allow depressurization of the cabin to an unsafe level. This safety assessment must include the physiological effects on the occupants.

(4) The open door during flight would not create aerodynamic interference that could preclude safe flight and landing.

(5) The airplane would meet the structural design requirements with the door open. This assessment must include the aeroelastic stability requirements of § 25.629, as well as the strength requirements of this subpart.

(6) The unlatching or opening of the door must not preclude safe flight and landing as a result of interaction with other systems or structures.

3. Amend § 25.807 by revising paragraph (h) to read as follows:

§ 25.807 Emergency exits.

* * * * *

(h) Other exits. The following exits also must meet the applicable emergency exit requirements of §§ 25.809 through 25.812, and must be readily accessible:

(1) Each emergency exit in the passenger compartment in excess of the minimum number of required emergency exits.

(2) Any other floor-level door or exit that is accessible from the passenger compartment and is as large or larger than a Type II exit, but less than 46 inches wide.

(3) Any other ventral or tail cone passenger exit.

* * * * *

4. Amend § 25.809 by adding a new paragraph (b)(3), and by revising paragraphs (c) and (f), to read as follows:

§ 25.809 Emergency exit arrangement.

* * * * *

(b) * * *

(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. Internal exit-opening means involving sequence operations (such as operation of two handles or latches, or the release of safety catches) may be used for flightcrew emergency exits if it can be reasonably established that these means are simple and obvious to crewmembers trained in their use.

* * * * *

(f) Each door must be located where persons using them will not be endangered by the propellers when appropriate operating procedures are used.

* * * * *

5. Amend § 25.810 by adding a new paragraph (e) to read as follows:

§ 25.810 Emergency egress assist means and escape routes.

* * * * *

(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.

* * * * *

6. Add a new § 25.820 to read as follows:

§ 25.820 Lavatory doors.

All lavatory doors must be designed to preclude anyone from becoming trapped inside the lavatory. If a locking mechanism is installed, it must be capable of being unlocked from the outside without the aid of special tools.

Issued in Renton, Washington, on DEC 20 2002

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