DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 25 and 121

[Docket No. FAA–2004–19629, Amendment Nos. 25–117 and 121–307]

RIN 2120–AF21

Revision of Emergency Evacuation Demonstration Procedures To Improve Participant Safety

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: These amendments revise the airworthiness standards for transport category airplanes and the operating requirements for domestic, flag, and supplemental operations, by allowing certain alternative procedures in conducting full-scale emergency evacuation demonstrations for transport category airplanes. The changes will make full-scale emergency evacuation demonstrations safer for participants and will codify existing practices.

DATES: December 17, 2004.

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SUPPLEMENTARY INFORMATION:

Availability of Rulemaking Documents

(**Note:** The FAA transitioned to the new Department of Transportation's Management System (DMS) during the course of this rulemaking. At earlier stages of the rulemaking, the docket number was ''28272.'' Under the new DMS, the docket number is FAA–2004–19629.)

You can get an electronic copy using the Internet by:

(1) Searching the DOTs electronic DMS Web page (*http://dms.dot.gov/search*);

(2) Visiting the Office of Rulemaking's Web page at *http://faa.gov/avr/arm/index.cmf;* or

(3) Assessing the Government Printing Office'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. Make sure to identify the amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the amendment, if submitted on behalf of an association, business, labor union, etc. You may review DOT's complete Privacy statement in the **Federal Register** publication on April 11, 2000 (volume 65, number 70, pages 19477–78) or you may visit *http://dms.dot.gov.*

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official, or the person listed under **FOR FURTHER INFORMATION CONTACT**. You can find out more about SBREFA on the Internet at our site, *http://www.faa.gov/avr/arm/sbrefa.htm*. For more information on SBREFA, e-mail us at *9-AWA-SBREFA@faa.gov.*

Background

Notice of Proposed Rulemaking

These amendments are based on Notice of Proposed Rulemaking (NPRM), Notice No. 95–9, which was published in the **Federal Register** on July 18, 1995 (60 FR 36932). In that proposed rule, the FAA proposed to amend 14 Code of Federal Regulations (CFR) parts 25 and 121. Appendix J to part 25 would be changed to allow certain alternative procedures to be used during the conduct of full-scale emergency evacuation demonstrations. Section 121.291(b)(1) would be changed to require that even operators whose crews participate in a manufacturer's full-scale demonstration perform a partial evacuation demonstration upon entry of a new model into service.

Part 25 contains the airworthiness standards for transport category airplanes. Manufacturers of transport category airplanes must show that each airplane they produce complies with the relevant standards of part 25. These standards apply to airplanes manufactured within the U.S. and in other countries that import the airplanes under a bilateral airworthiness agreement. One of the standards that manufacturers must meet is that of demonstrating that passengers and crewmembers can be evacuated in a timely manner in an emergency. This standard is addressed by the requirements in § 25.803 and Appendix J to part 25. This standard is intended to demonstrate emergency evacuation capability under a consistent set of prescribed conditions but is not intended to demonstrate that all passengers can be evacuated under all conceivable emergency conditions.

Part 121 contains the requirements governing the operations of domestic, flag, and supplemental air carriers, and commercial operators of large airplanes. One of the requirements is that the certificate holder must demonstrate the effectiveness of the crewmember training and operating procedures for opening floor level and non-floor level exists and for deploying the evaluation slides, if installed, in a timely manner.

History of the Emergency Evacuation Regulations

Amendment 121–2, effective March 3, 1965, first introduced the requirements for an emergency evacuation demonstration in part 121. Operators operating under part 121 were required to conduct full-scale emergency evacuation demonstrations using 50 percent of the airplane's exits within 120 seconds. Half of the exits were rendered inoperative to simulate the type of emergency where fire, structural, or other adverse conditions would prevent those exits from being used. Operators were required to conduct a demonstration during the initial introduction of a type and model of airplane into passenger-carrying operations and when an airplane passenger seating capacity increased five percent or greater or when a major change was made to the interior arrangement that would affect emergency evacuation. The purposes of the demonstration were to demonstrate the ability of crewmembers to execute established emergency evacuation procedures, and to ensure realistic assignments of crewmember functions.

Amendment 25–15, effective October 24, 1967, introduced the emergency evacuation requirements into part 25. Newly created § 25.803 required airplane manufacturers to conduct an emergency evacuation demonstration for passenger-carrying airplanes with passenger seating capacity of 44 or more, within 90 seconds. The purpose of this demonstration was to establish the evacuation capability of the airplane. Section 25.803(d) listed conditions under which analysis could be used in lieu of a full-scale demonstration to demonstrate compliance with the regulation. The section stated that the full-scale demonstration did not have to be repeated for a change in the interior arrangement, or for an increase in passenger capacity of less than five

percent, if it could be substantiated by analysis that all occupants could be evacuated in less than 90 seconds.

Amendment 121–30, effective October 24, 1967, reduced the demonstration time. This reduction was primarily attributable to significant gains made in the efficacy of devices, such as inflatable slides, to assist in the evacuation. The purpose of the part 121 demonstration is crew training and crew procedures so that demonstration conditions remained somewhat different between the two parts.

Amendment 25–46, effective December 1, 1978, revised § 25.803 to allow means other than actual demonstration to show the evacuation capability of the airplane. It also replaced the existing part 25 demonstration conditions with conditions that would satisfy both parts 25 and 121. One demonstration could be used to satisfy both requirements. In addition, § 25.803 was revised to allow analysis in combination with tests to be used to substantiate compliance for an increase in seating capacity of more than five percent. Amendment 121–149, effective December 1, 1978, revised part 121 to accept the results of demonstrations conducted in compliance with § 25.803 as of Amendment 25–46.

Amendment 25–72, effective August 20, 1990, placed the demonstration conditions previously listed in § 25.803(c) into a new Appendix J to part 25 and amended them for clarification and editorial consistency with part 121.

Amendment 25–79, effective September 27, 1993, revised the age/gender mix in Appendix J to part 25 to be used when running an emergency evacuation demonstration. The revision allowed the use of stands or ramps for descending from overwing exits only when the airplane is not equipped with an off-wing descent means, and prohibited the flightcrew from taking an active role in assisting in the passenger cabin.

Amendment 121–233, effective September 27, 1993, revised § 121.291 to allow demonstrations in compliance with § 25.803 in effect on or after December 1, 1978—not just in effect on December 1, 1978—to satisfy the requirements of § 121.291.

Injuries During Full Scale Emergency Evacuation Demonstrations

Hundreds of people jumping from an airplane in simulated dark of night conditions onto inflated slides, sliding as many as 25 feet to the ground, can result in some injuries. In a sampling of seven full-scale evacuation demonstrations conducted between 1972 and 1980, involving 2,571 passengers and crewmembers, 166 participants suffered injuries (''An FAA Analysis of Aircraft Emergency Evacuation Demonstrations,'' 1982, Society of Automotive Engineers Technical Paper Series #82148).

Additionally, a review of 19 full-scale evacuation demonstrations between 1972 and 1991, involving 5,797 participants, identified 269 injuries, or 4.5 percent of the passenger and crewmembers. In the seven demonstrations for which there was information on the types of injuries, of 216 people, 13 suffered fractures, 63 sprains or strains, 32 contusions, and 108 suffered lacerations or abrasions. In one of the demonstrations involving a McDonnell Douglas DC–11 for 410 passengers, a participant was seriously injured, resulting in paralysis. For its second attempt to certificate the MD–11 on December 11 and 12, 1992, McDonnell Douglas replaced the slides with level platforms or gently sloped ramps, and the exterior or the aircraft was lighted.

In addition, the U.S. Congressional Office of Technology Assessment reported that on average, 6 percent of full-scale emergency evacuation demonstration participants are injured during full-scale tests (''Aircraft Evacuation Testing. Research and Technology Issues'' September 1993, OTA–BP–SET–121, NTIS Order #107620).

The Aviation Rulemaking Advisory Committee

The FAA formally established the Aviation Rulemaking Advisory Committee (ARAC) on January 22, 1991, to provide advice and recommendations to the FAA concerning the full range of the FAA's safety-related rulemaking activity (56 FR 2190).

Members of ARAC interested in issues involving emergency evacuation met on May 24, 1991, and instituted the charter and membership for the Performance Standards Working Group (PSWG), for a working group that would report to ARAC. Members of the PSWG included United States and European representatives from airplane and parts manufacturers, pilot, flight attendant and machinist unions, airlines, airworthiness authorities, passenger associations, and other public interest groups. The PSWG charter instructed the working group to recommend to the ARAC whether new or revised emergency evacuation standards could and should be stated in terms of performance standards rather than design standards.

On October 26, 1991, two unsuccessful emergency evacuation demonstrations were conducted on an airplane for which increased seating capacity was sought. During one of them, a participant was seriously injured. Following the demonstrations, the FAA tasked the ARAC to draft recommendations for revising the emergency evacuation demonstration requirements and compliance methods to eliminate or minimize the potential for injury to demonstration participants. The ARAC accepted the task and decided to add this task to the charter of the PSWG.

In response to this additional task, the PSWG drafted a report for discussion. The draft report consisted primarily of two sets of recommendations—(1) Changes that could be made to the current demonstration that would improve participant safety, but would not alter the basic character of the demonstration; and (2) analysis that could be used in lieu of the full scale demonstration, plus an outlined step-by-step methodology for preparing such an analysis. The former recommendation would require a revision to Appendix J to part 25, while the latter recommendations would expand FAA guidance currently in Advisory Circular 25.803–1, Emergency Evacuation Demonstrations. The report was revised numerous times, over several PSWG meetings, based on comments from PSWG members. Nonetheless, after numerous attempts to develop a report that was acceptable, members of the working group were unable to reach consensus.

Representatives of three organizations on the PSWG wrote letters stating their objections to the report as finalized. These letters are included as Appendix 2 of the report. Comments were primarily aimed at the proposed revisions to the existing advisory circular and not to the revisions to Appendix J of part 25 contained in the NPRM. The objectors expressed concern that the committee did not systematically review the causes of injuries in emergency evacuation demonstrations, and thus could not make meaningful recommendations to reduce or eliminate those injuries. Instead, the objectors felt that the committee had concentrated on an approach which would effectively eliminate the full-scale demonstration.

The report was forwarded to the ARAC on January 28, 1993, and then forwarded on to the FAA. The ARAC then tasked the PSWG to draft the appropriate rulemaking document and revise the advisory material as recommended in the report. The PSWG

completed the task and the recommendations were accepted by the FAA. These amendments cover the recommended revisions to part 25 covered in the report, ''Emergency Evacuation Requirements and Compliance Methods That Would Eliminate or Minimize the Potential for Injury to Full Scale Evacuation Demonstration Participants.'' A copy of the report has been placed in the docket. The FAA is developing a revised advisory circular based on the report submitted by ARAC.

Discussion of the Final Rule

This amendment changes Appendix J to part 25 to reduce the possibility of injury to participants in a full-scale emergency evacuation demonstration and to codify existing practice regarding airplanes equipped with overwing slides as recommended by the ARAC.

Exterior Lighting

Paragraph (a) of Appendix J is amended to allow exterior light levels of 0.3 foot-candles or less prior to the activation of the airplane emergency lighting system, in lieu of ''dark of night'' conditions. This light level is approximately the level that would be found in the passenger cabin when the emergency lighting system is the only source of illumination. Allowing this low level of lighting outside the airplane enhances the ability of the demonstration director to see and react more quickly to problems that may develop during the demonstration. While this does not prevent injuries incurred at the onset of the problems, it could result in reducing the number of injuries by halting the demonstration sooner than in the past. Specific tests were not run to ascertain whether or not such exterior ambient lighting would enhance or detract from evacuation performance, since it was considered that crew performance, escape system efficiency, and illumination provided by the airplane emergency lighting system have the predominant impact on evacuation performance. As discussed below, airplane exterior emergency lighting is being addressed separately.

Pre-Deployment of Escape Slides

Paragraph (p) of Appendix J is revised to allow exits with inflatable slides to have the slides deployed and available for use prior to the start of the demonstration. If this method were used, the exit preparation time, which would be established in separate component tests, would need to be accounted for in some manner. This change prevents a participant exiting the airplane before the slide is fully available for use, which has occurred in at least two instances. In both cases, the participant was not seriously injured; however, the potential for serious injury is great, particularly considering the sill heights of wide-body airplanes.

An additional benefit is that pre-deployed and inflated slides are not subject to damage from equipment that is placed near the airplane to facilitate conduct or documentation of the demonstration (for example, infrared lighting). The pre-deployment and inflation of slides also allows the proper placement and opportunity for inspection of safety mats around the slide prior to the start of the demonstration. Additionally, paragraph (p) is revised to require that the exits that are not to be used in the demonstration must be clearly indicated once the demonstration has started. The more general wording of this change accommodates the additional flexibility in exit configuration (slide stowed or pre-deployed and inflated).

Finally, the opening sentence in paragraph (p) is revised to more succinctly describe the exits that are to be used in the demonstration. The ''exit pairs'' in this regulation are as discussed in the passenger seating tables in § 25.807(g). This change responds to numerous prior requests to the FAA for clarification of the existing text. As in the past, exits which are not installed in pairs, typically tail cone or ventral exits, are not used in the demonstration.

Paragraph (f) of Appendix J is revised to remove the requirement that each external door and exit be in the takeoff configuration. This change is necessary to be consistent with the change to paragraph (p), noted above, which allows slides to be deployed and inflated prior to the start of the demonstration. If the option to pre-deploy the slide is selected by the applicant, the FAA must approve the specific procedures to prevent demonstration participants from determining which exits will be used, as well as the method of making the exits available, prior to the demonstration. The method of assessing the impact on the resulting evacuation times for each of the exits used must also be agreed in advance.

Paragraph (o) of Appendix J is revised to state more generally its intent rather than requiring specific actions. The intent is that participants inside the airplane should not be able to identify, prior to the start of the demonstration, which exits will be used during the demonstration. Although this may be made more difficult if an applicant elects to utilize pre-deployed escape slides in accordance with the change to paragraph (p), this change is in keeping with general regulatory practice. This change is not specifically related to reducing injuries.

Safety Briefing

Paragraph (n) of Appendix J is revised to allow passengers to be briefed on safety procedures that are in place for the particular demonstration, *e.g.,* procedures to abort the demonstration, or procedures that have to do with the demonstration site, *e.g.,* how to evacuate the building in which the demonstration is being conducted. The revision also notes when that briefing could take place. This briefing could help some participants from adding to an already potentially injurious situation in the event of problems, such as a collapsed evacuation slide. It could also provide information that would be helpful in case of a problem at the demonstration site, *e.g.,* a fire in the building. The briefing would have to be carefully constructed so as not to impart any information that would enable the participants to evacuate the airplane faster. Additionally, the appropriate time for the passenger briefing required by § 121.571 has been added.

Other Changes

The ARAC recommended that paragraph (c) of Appendix J be amended to allow the use of stands or ramps for overwing exits only if assist means are not required as part of the airplane type design. It was not proposed in Notice No. 95–9, however because that change has already been implemented by Amendment 25–79.

Another of the recommendations involved revising the age/gender mix to require using only the age/gender groups least susceptible to injury. It was not proposed in Notice No. 95–9, pending research to identify the groups and develop an appropriate mix. A group of participants based on the new mix would have to have the same evacuation capability as a group based on the existing mix. This possible future proposal would be in addition to the change to the mix adopted by Amendment 25–79.

This amendment also makes minor revisions to part 121, to be consistent with the changes being made to part 25. Section 121.291(a) requires that certificate holders must conduct an emergency evacuation demonstration in accordance with paragraph (a) of Appendix D to part 121, or in accordance with § 25.803 of part 25. Section 25.803 incorporates by reference Appendix J of part 25 which is amended by this final rule. Section 121.291(b)(1) is amended to require that even

operators whose crews participate in a manufacturer's full-scale demonstration perform a partial evacuation demonstration upon entry of a new model into service. This change will account for aspects of the operator's evacuation procedure that might be lost if the manufacturer elects to conduct the full-scale demonstration with pre-deployed slides.

Discussion of Comments

Comments were received from 10 parties, representing foreign and domestic airplane manufacturers, labor associations, foreign and domestic operators, as well as foreign regulatory authorities and one individual. Each proposed change received comments. Two commenters support the proposals with minor editorial suggestions. Four commenters agree with specific aspects of the proposals, and did not comment on others. Four commenters disagree with at least parts of the proposals.

Exterior Lighting

Three commenters support and four commenters oppose the proposal to allow a specified ambient light level, exterior to the airplane, for the purposes of conducting the full-scale evacuation demonstration.

Commenters opposing the change cite the lack of specific research to support the proposed light level, and contend that such light levels would, in any case, speed the evacuation. One commenter suggests that night vision goggles could be provided to the test directors to enable them to survey the situation and thereby achieve the same objective as the proposal. One commenter cites a non-aviation research study where an increase in ambient light level increased the speed of evacuation for different age groups. This commenter also suggests that the proposed light level would be acceptable, if it were produced by the airplane's emergency lighting system.

While the FAA acknowledges that the proposed exterior light level is not based on dedicated research, this level is considered reasonable, based on several factors. First, the proposed light level is still quite dim, particularly in comparison with the typical emergency cabin lighting environment. Second, as is discussed below, the area surrounding the airplane is not a primary factor in the speed of evacuations as compared to the escape slide itself, and its conspicuity. Third, as discussed later, the FAA tasked the ARAC working group to develop qualification methods for escape slides that would determine their usability under strict dark of night conditions. The qualification of the escape slides in the absence of ambient illumination means that the ambient illumination level for the demonstration would not be critical.

The FAA agrees that the use of night vision goggles could improve some aspects of the test directors' ability to assess the situation during the full-scale evacuation. However, the results would not be equivalent since the goggles will not provide peripheral visual information, and will be distorted by the light that is produced by the airplane's emergency lighting system. Thus, while this amendment would not prohibit the use of night vision goggles, that approach is not considered a direct substitute for the proposal.

Numerous airplane evacuation studies have been conducted in daylight conditions, as well as ''dark of night'' conditions. Statistically, the evacuation rates seen in these diametrically opposed illumination conditions have been equivalent. The FAA also reviewed certification test data for tests conducted in daylight and dark of night conditions, where the other parameters are the same, and has seen no statistical difference in evacuation rates. However, to maintain the ''feel'' of a nighttime evacuation and address the safety of participants, the FAA has chosen a low light level that will still provide enhanced situational awareness to the demonstration director.

An important adjunct to the change in ambient illumination level is the change to the requirements for escape slide qualification relative to dark of night conditions. The FAA and the ARAC have developed new methods of escape slide qualification testing that would ensure that the escape system itself has adequate lighting capability to enable rapid evacuation in the absence of any other source(s) of light. The FAA has incorporated these methods into the Technical Standard Order (TSO) C69 for escape slides. The rule change adopted here pertains to the full-scale evacuation demonstration only. Qualification of the escape systems is an independent requirement and should be largely completed prior to the full-scale evacuation demonstration. In the past, qualification of the escape systems has not always been completed prior to the full-scale evacuation demonstrations. The FAA, however, considers that qualification of the system is an essential element of this amendment. Since the change adopted here applies to new type certificates, the FAA expects that the TSO revision will be adopted prior to a full-scale evacuation demonstration for type certification in accordance with this amendment. Should that prove not to be the case, the FAA will still require that the escape systems lighting performance be substantiated in an approved manner prior to the demonstration.

The FAA reviewed the research study cited by the commenter and concluded that the findings in the study do not directly relate to the full-scale evacuation requirement. The study is primarily an assessment of a test subject's ability to negotiate an unknown evacuation path in conditions of varied illumination. This proposal addresses lighting conditions, which only become evident upon leaving the airplane, after the evacuees have negotiated the evacuation path.

In addition, the reflectivity of the test environment in the study is much higher than would be allowed by this amendment, increasing the effective ambient illumination. Further, differences in egress performance are greatly reduced when luminous versus non-luminous signs were used for a given illumination level. This indicates that the test subjects performed poorly at effective ambient illumination levels above those allowed by this amendment, and that ambient illumination may not be the primary factor controlling performance in the conditions tested. In summary, the FAA has concluded that the study does not directly relate to this amendment and, as discussed above, issues related to escape slide performance have been addressed in TSO C69.

The FAA does not agree that increased ambient light level should be required to be generated by the airplane's emergency lighting system. The current standards for airplane emergency lighting systems have been shown to be adequate for evacuation. The purpose of allowing increased ambient lighting in this amendment is not to assist in the evacuation, but to assist in monitoring the evacuation to insure participant safety. As noted earlier, the qualification of the actual lighting will be a requirement for certification. The commenter's suggestion would essentially change the regulations for exterior emergency lighting, which is beyond the scope of the notice.

Pre-Deployment of Escape Slides

Two commenters support, while four commenters oppose the proposal to allow the demonstration to be conducted with escape slides pre-deployed.

Commenters supporting the proposal note the potential to prevent injuries resulting from persons leaving the

airplane prior to the escape slide being ready for use, for whatever reason.

Commenters opposing the proposal cite various reasons for their opposition. Some commenters state that separating exit operation and evacuation would not demonstrate the efficacy of flight attendant training. Some commenters assert that not having a specific methodology for accounting for the pre-deployed slides will invalidate the demonstration. A commenter suggests that this option is purely a cost saving measure to avoid repeating tests that fail on account of equipment failure. One commenter suggests that the noise of deploying slides and opening doors is not accounted for as part of the demonstration, and will reduce the ''chaos and distraction'' aspects of the demonstration. Another commenter notes that the risk of persons leaving the airplane early can be accommodated by different designs that prevent the doors from opening prior to the escape slide being deployed.

The FAA has considered all the comments and believes that, while many of the issues raised require consideration, the proposal is sound and does not require changes.

In the case of the flight attendant training program and the crews' interaction with the escape systems, the change to § 121.291(b)(1) would necessitate that the operators conduct a partial evacuation demonstration before entering service, whether or not that operator's crew participated in the full-scale evacuation demonstration. Since typically only one operator's crew participates in the full-scale part 25 evacuation demonstration, the training benefits that might result from the demonstration are limited to that operator. This proposal would actually increase the number of operators required to conduct a partial evacuation demonstration in accordance with § 121.291(b)(1), over what was previously required.

In addition, regarding the comment that the proposal is intended to avoid repeat demonstrations due to equipment failure, qualification of equipment is not the purpose of the demonstration. Under § 25.810, the certificate holder would have to demonstrate the proper operation of the escape systems from a mechanical standpoint and it is not appropriate to rely on the full-scale evacuation demonstration to identify problems with equipment. The full-scale demonstration is intended to address the gross evacuation capability of the airplane and its crew, and not to address specific equipment qualification.

The FAA has not proposed a specific methodology to pre-deploy the escape slides since deployment will vary among the different exit designs. In addition, recommendations on methodology are more appropriately the function of advisory material. While there is no obvious need for advisory material at this time, if a need develops appropriate guidance will be prepared.

The FAA has determined that there are means of accounting for pre-deployed escape slides that will not compromise the evacuation demonstration. Issues that must be addressed include the time it takes for a flight attendant to operate and assess the availability of the exit; the inflation time of the slide; the queue of passengers that might form while the slide is inflating and the effect that the queue has on the initial evacuation rate. Many of these issues could be addressed by correctly timing the availability of the exits to be used in the demonstration.

As is currently the case, exits that will be used must not be distinguishable from exits that will not be used, prior to the demonstration. This approach may necessitate the use of special covers over all exits, for example. In those cases where it is not possible to develop a satisfactory methodology, the applicant will not be able to use the option of pre-deployed slides.

Predeployment of slides will reduce the potential for slide failure or damage to slides that can occur during a demonstration. This could avoid repeating a demonstration and the applicant costs associated with repeating. But the purpose of the evacuation demonstration is to determine if the aircraft, as designed, can be evacuated in a timely manner. The test limitation allowing use of only 50 percent of available slides accounts for the potential for unusable slides. The reliability of the slide system is required to be demonstrated separately under § 25.810. Although the potential for repeat demonstrations may be reduced, the reason for considering this change is to prevent injuries.

The noise that is produced by deploying escape slides is not generally accounted for, if the slides are pre-deployed. The FAA is unaware of what role, if any, the sound of deploying escape slides plays in an evacuation demonstration. Research tests conducted with pre-deployed escape slides result in evacuation rates consistent with those produced in full-scale demonstrations that do not pre-deploy slides. In addition, and as the basis for the proposal, in past full-scale evacuation demonstrations, passengers frequently reached the exit before the slide was fully deployed and, in some cases, have left the airplane before the slide is ready. It is doubtful that the absence of the sounds of deployment will cause them to reach the exit any sooner. Nonetheless, if there are data that indicate that the sounds are necessary, it would be a simple matter to include recorded sounds, as a part of the other procedures that will be needed to follow this option. At this time, however, the data do not suggest that this is necessary.

It is true that the escape system design could be such that the exits were prevented from opening until the escape slide was fully deployed. However, such a requirement could have the unintended effect of delaying an evacuation in an accident. Under actual emergency conditions it is less likely that persons would depart the airplane prior to the escape slide's deployment, since there is no defined ''start'' signal such as there is in a demonstration. Under actual conditions, the sooner the escape slide is available, the more likely the success of the evacuation. Since the escape slide is not available to passengers until the exit is open, requiring the exits to delay opening would not be in the interest of safety. It should be noted that there are specific designs that incorporate features to permit the exit opening to coincide with the slide deployment, that do not delay the overall exit system availability. Such designs would, of course, continue to be acceptable.

Safety Briefing

Three commenters support and three commenters oppose the proposal to allow a safety briefing for test participants. One commenter expresses concern regarding the use of test participants' to assist at the bottom of the escape slides, commenting that this is better left to test personnel.

Most commenters opposing the proposal were not specific as to their opposition, other than concern that the briefing could somehow enable the participants to evacuate faster. As stated in Notice No. 95–9, the purpose of this provision is to convey safety information about the logistics of the demonstration site and test sequence. The notice also states that such briefings would have to be carefully constructed in order not to disclose information about the demonstration itself. In actual practice, the manufacturers have conducted such briefings in the past, but with no real standardization. This amendment provides codification of that practice and gives information as to

content and when such a briefing can take place.

With respect to persons who are assigned to assist at the bottom of the slide, the FAA agrees with the commenter who believes that test personnel would probably be the best choice. However, if an operator's procedures included assigning passengers to perform this duty, they should not be precluded from employing the same procedures in the demonstration. This provision would not override the safety procedures to be followed for demonstration purposes and, should problems develop, it might be necessary for test personnel to provide additional assistance. Were that to occur, the contribution of the test personnel would have to be assessed to determine whether the validity of the demonstration had been affected. The proposal is therefore adopted.

Other Comments

Other comments concerned editorial suggestions that have been adopted where appropriate, and some comments that were beyond the scope of the notice. One commenter suggests that the combination of exits likely to result in the slowest evacuation times should be required in paragraph (p) of Appendix J of part 25, and not one from each pair of exits, as proposed. The current standard contained in the first sentence of paragraph (p) only requires that not more than 50 percent of the exits are used in the demonstration. Currently, applicants are free to select any combination of exits. The proposed change to the first sentence of paragraph (p) was intended to reflect current practice of using one exit from each pair, not to establish a new standard. The commenter's suggestion would create a more stringent standard. Although the comments may be applicable to future rulemaking in this area, they were not considered applicable to this proposal.

One commenter recommends against combining the demonstration requirements for parts 25 and 121. The provision to demonstrate compliance with both parts 25 and part 121 actually occurred in Amendments 25–46 and 121–149, in 1978, and was not a part of NPRM 95–9.

Finally, commenters contend that the proposal is an indirect effort to do away with the full-scale demonstration entirely. Since the entire proposal focuses on procedures for conducting the demonstration, this contention is not accurate. The FAA will continue to require full-scale demonstrations when appropriate.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), there are no current or new requirements for information collection associated with this amendment.

International Compatibility With ICAO Standards

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practical. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and the Joint Aviation Authorities regulations, where they exist, and has identified no differences in these amendments and the foreign regulations.

Economic Evaluation, Regulatory Flexibility Determination, International Trade Impart Assessment, and Unfunded Mandates Assessment

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 impact of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. 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 requires agencies to consider 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, in any one year (adjusted for inflation.)

For regulations with an expected minimal impact a complete regulatory evaluation is not required. The Department of Transportation Order DOT 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 proposal does not warrant a full Evaluation, a statement to that effect and the basis for it is included in the final regulation. Since this final rule revises existing rules and codifies existing practices, the expected outcome is to have a minimal impact with positive net benefits. The justification for the minimal impact determination follows.

Regulatory Evaluation Summary

Exterior Lighting

In the original NPRM, the FAA estimated that it will take two engineers and two technicians ½ hour at burdened rates of $60 and $45 per hour, respectively, to prepare and adjust the exterior lighting level to 0.3 foot-candles or less, at a cost of $105.

Predeployment of Escape Slides

The final rule removes the requirement in paragraph (f) that the external doors and exits be in the takeoff configuration. No costs are associated with this change.

Safety Briefings

Paragraph (n) is amended to allow demonstration participants to be briefed only with respect to safety procedures in place for the demonstration or the demonstration site, such as demonstration abort procedures or procedures pertaining to the demonstration site. Flight attendants will be allowed to assign demonstration subjects to assist other participants from the bottom of the slide. The final rule will continue to prohibit passengers from being instructed on procedures to be followed in the demonstration. No costs are attributed to these changes.

Paragraph (o) requires that the airplane be configured so that available emergency exits are not disclosed to participants. This revision states more generally the intent of the requirement rather than specific actions. Associated costs are described in comments pertaining to paragraph (p) below.

Paragraph (p) allows exits with inflatable slides to be opened with the slides deployed prior to the start of the demonstration timing. The final rule retains the current requirement that all exits will have to be configured so that the usable exits are not disclosed to participants prior to the demonstration. Manufacturers currently cover all windows to prevent participants from determining which exits will be usable in the demonstration. The FAA estimates that, under the final rule, manufacturers will also cover exits with curtains, screens, or other means to prevent premature disclosure of active exits. These screening devices will cost approximately $1,000 for labor and

materials. (Depending on future airplane designs, slides may be able to be deployed without opening the exits they serve. In those cases, there will be no costs for screening devices because it will not be necessary to cover the exit doors to prevent participants from determining which exits will be used.)

Costs

The final rule does not necessarily result in additional compliance costs, because it allows *alternative* procedures in conducting demonstrations, rather than mandating them. If manufacturers elect to use the final procedures, however, the FAA estimates that there will be incremental costs of approximately $1,105 per demonstration. These costs will be insignificant in comparison to the total cost of an evacuation demonstration, estimated to range between $1,000,000 and $2,000,000.

Benefits

The risk of injury to passengers during repetitive full-scale emergency demonstrations is appreciable.

The FAA reviewed seven full-scale evacuation demonstrations conducted between 1972 and 1980 (''An FAA Analysis of Aircraft Emergency Evacuation Demonstrations''). Of the 2,571 participants in the demonstrations, 166, or 6.5 percent were injured.

In addition, the Office of Technology Assessment states that on average, 6 percent of full-scale emergency evacuation demonstration participants are injured during full-scale tests (''Aircraft Evacuation Testing: Research and Technology Issues'', September 1993, OTA–BP–SET–121, NTIS order #PB94–107620).

The FAA reviewed 19 demonstrations conducted between 1972 and 1991. Of the 5,797 participants in the demonstrations, 269 were injured. In the seven demonstrations for which there was information on the types of injuries, 13 suffered fractures, 63 sprains or strains, 32 contusions, and 108 suffered lacerations or abrasions, a total of 216 people injured. This review revealed 4.5 percent of the passengers or crewmembers received injuries. In one of the emergency evacuation demonstrations reviewed by the FAA, a participant was seriously injured, which resulted in paralysis. The FAA believes a 4.5% injury rate during an emergency evacuation demonstration is not an acceptable safety practice.

Personnel participating in the demonstration should be protected from potential injury without compromising the test results (''Emergency Evacuation Demonstrations'', AC 20–118). The primary benefit of the rule will be reduced risks of injuries to demonstration participants.

The National Transportation Safety Board (NTSB) classifies fractures, strains, contusions, lacerations, and abrasions as ''minor'', ''moderate'', or ''Critical'' according to the abbreviated injury scale (AIS) used. The FAA estimates that the average cost of a ''minor injury'' is $5,400, the average cost of a ''moderate'' injury is $41,900, and the average cost of a ''Critical'' injury, resulting in paralysis, is $2,058,800 (''Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs,'' (FAA–APO–98–8), Treatment of the Values of Life and Injury in Economic Analyses). Avoiding only one minor injury during an evacuation demonstration will result in cost savings exceeding the estimated $1,105 incremental costs of the alternative procedures.

The emergency evacuation demonstration must be conducted during the dark of night or with the dark of night simulated, so that the airplane's emergency lighting system provides the only illumination of exit paths and slides (''Aircraft Evacuation Testing: Research and Technology Issues,'' September 1993, OTA–BP–SET–121, NTIS order #PB94–107620). But allowing low-level light, outside the airplane, will enhance the ability of the demonstration director to react more quickly to problems, which could develop during the demonstration. The ability of the demonstrator to react more quickly to problems could reduce the risk of injuries to demonstration participants.

The FAA has determined since costs will be minor, and the benefits could be significantly higher than the costs, the rule will be cost-beneficial.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was 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 Act 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 small businesses, not-for-profit organizations and small governmental jurisdictions.

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

However, if 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 1980 act 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.

This final rule will make full-scale emergency evacuation demonstrations safer for participants and will codify existing practices. Because there are no manufacturers of part 25 airplanes with 1,500 or fewer employees,[1] the FAA certifies that the final amendments will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Analysis

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 and policy, the FAA has assessed the potential effect of this final rule to be minimal and therefore has determined that this final rule will not result in an impact on international trade by companies doing business in or with the United States.

Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (the Act) is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments.

Section 202(a) (2 U.S.C. 1532) of Title II of the Act requires that each Federal agency, to the extent permitted by law, prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may

[1] 13 CFR 121.201, Size Standards Used To Define Small Business Concerns, Sector 48–49 Transportation, Subsector 481 Air Transportation.

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; such a mandate is deemed to be a ''significant regulatory action.'' The FAA currently uses an inflation-adjusted value of $120.7 million in lieu of $100 million. Section 203(a) of the Act (2 U.S.C. 1533) provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, an agency shall have developed a plan under which the agency shall: (1) Provide notice of the requirements to potentially affected small governments, if any; (2) enable officials of affected small governments to provide meaningful and timely input in the development of regulatory proposals containing significant Federal intergovernmental mandates; and, (3) inform, educate, and advise small governments on compliance with the requirements. With respect to (2), Section 204(a) of the Act (2 U.S.C. 1534) requires the Federal agency to develop an effective process to permit elected officers of State, local, and tribal governments (or their designees) to provide the input described.

This final rule does not contain a significant Federal intergovernmental/private sector mandate. Therefore, the requirements of Title II do not apply.

Executive Order 3132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. We determined that this action will not have a substantial direct effect on the State, or the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, we determined that this final rule does not have federalism implications.

Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 312f and involves no extraordinary circumstances.

Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a ''significant energy action'' under the executive order because it is not a ''significant regulatory action'' under Executive Order 12855, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

List of Subjects

14 CFR Part 25

Air transportation, Aircraft, Aviation safety, Safety.

14 CFR Part 121

Aviation safety, Safety, Air carrier, Air traffic control, Air transportation, Aircraft, Aircraft pilots, Airmen, Airplanes, Airports, Airspace, Cargo Chemicals, Children, Narcotics, Flammable materials, Handicapped, Hazardous materials, Common carriers.

The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends parts 25 and 121 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. Appendix J to part 25 is amended by revising paragraphs (a), (f), (n), (o), and (p) as follows:

Appendix J to Part 25—Emergency Evacuation

* * * * *

(a) The emergency evacuation must be conducted with exterior ambient light levels of no greater than 0.3 foot-candles prior to the activation of the airplane emergency lighting system. The source(s) of the initial exterior ambient light level may remain active or illuminated during the actual demonstration. There must, however, be no increase in the exterior ambient light level except for that due to activation of the airplane emergency lighting system.

* * * * *

(f) Each internal door or curtain must be in the takeoff configuration.

* * * * *

(n) Prior to entering the demonstration aircraft, the passengers may also be advised to follow directions of crewmembers but may not be instructed on the procedures to be followed in the demonstration, except with respect to safety procedures in place for the demonstration or which have to do with the demonstration site. Prior to the start of the demonstration, the pre-takeoff passenger briefing required by § 121.571 may be given. Flight attendants may assign demonstration subjects to assist persons from the bottom of a slide, consistent with their approved training program.

(o) The airplane must be configured to prevent disclosure of the active emergency exits to demonstration participants in the airplane until the start of the demonstration.

(p) Exits used in the demonstration must consist of one exit from each exit pair. The demonstration may be conducted with the escape slides, if provided, inflated and the exits open at the beginning of the demonstration. In this case, all exits must be configured such that the active exits are not disclosed to the occupants. If this method is used, the exit preparation time for each exit utilized must be accounted for, and exits that are not to be used in the demonstration must not be indicated before the demonstration has started. The exits to be used must be representative of all of the emergency exits on the airplane and must be designated by the applicant, subject to approval by the Administrator. At least one floor level exit must be used.

* * * * *

PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

■ 3. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 40119, 41706, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 46105.

■ 4. Section 121.291 is amended by revising paragraph (b)(1) as follows:

§ 121.291 Demonstration of emergency evacuation procedures.

* * * * *

(b) * * *

(1) Initial introduction of a type and model of airplane into passenger-carrying operation;

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Issued in Washington, DC, on November 8, 2004.

Marion C. Blakey,

Administrator.

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