DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

49 CFR Part 238

[FRA Docket No. PCSS–1, Notice No. 8]

RIN 2130–AB48

Passenger Equipment Safety Standards

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: This document responds to petitions for reconsideration of the fire safety portion of FRA's May 12, 1999 final rule establishing comprehensive Federal safety standards for railroad passenger equipment. This document amends and clarifies the final rule.

DATES: The amendments to the final rule are effective August 26, 2002. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of August 26, 2002. The Director of the Federal Register previously approved the incorporation by reference of certain publications listed in Appendix B of 49 CFR part 238 as of July 12, 1999 (64 FR 25540, May 12, 1999).

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SUPPLEMENTARY INFORMATION:

Background

On June 17, 1996, FRA published an Advance Notice of Proposed Rulemaking (ANPRM) concerning the establishment of comprehensive safety standards for railroad passenger equipment. *See* 61 FR 30672. The ANPRM provided background information on the need for such standards, offered preliminary ideas on approaching passenger safety issues, and presented questions on various topics including fire safety. Following consideration of comments received on the ANPRM and advice from FRA's Passenger Equipment Safety Standards Working Group (Working Group), FRA published a Notice of Proposed Rulemaking (NPRM) on September 23, 1997, to establish comprehensive safety standards for railroad passenger equipment, including fire safety standards. *See* 62 FR 49728. In addition to written comment on the NPRM, FRA also solicited oral comment at a public hearing on November 21, 1997. FRA considered the comments received on the NPRM and advice from its Working Group in preparing a final rule, which was published on May 12, 1999. *See* 64 FR 25540.

Following publication of the final rule, parties filed petitions seeking FRA's reconsideration of the rule's requirements. These petitions principally related to the following subject areas: structural design; fire safety; training; inspection, testing, and maintenance; and movement of defective equipment. On July 3, 2000, FRA issued a response to the petitions for reconsideration concerning the final rule's requirements for the inspection, testing, and maintenance of passenger equipment, the movement of defective passenger equipment, and other related, miscellaneous provisions. *See* 65 FR 41284. On April 23, 2002, FRA responded to all remaining issues raised in the petitions for reconsideration other than those concerning the fire safety portion of the final rule. *See* 67 FR 19970.

FRA is hereby responding to the issues raised in the petitions for reconsideration concerning fire safety. FRA has responded by letter to certain issues raised in these petitions, and has otherwise provided guidance to the regulated community in explaining the rule's requirements. This **Federal Register** notice incorporates FRA's announcements and guidance on the rule. The amendments contained in this document generally clarify requirements currently contained in the final rule or allow for greater flexibility in complying with the rule, and are within the scope of the issues and options discussed, considered, or raised in the NPRM.

The specific issues and recommendations raised by the petitioners, and FRA's response to their petitions, are discussed in detail in the ''Section-by-Section Analysis'' portion of the preamble, below. The section-by-section analysis also contains a detailed discussion of each provision of the final rule which FRA has amended or clarified. This will enable the regulated community to more readily compare this document with the preamble discussions contained in the final rule and will aid in understanding the requirements of the rule.

Section-by-Section Analysis

Amendments to 49 CFR Part 238

Subpart A—General

Section 238.7 Waivers

This section sets forth the procedures for seeking waivers of compliance with the requirements of this part. FRA recognizes that circumstances may arise where the operation of passenger equipment that does not meet the standards contained in this part is nevertheless consistent with railroad safety and in the public interest. With respect to FRA's fire safety standards, FRA understands that railroads may desire to use materials in their passenger equipment that do not comply with the test performance criteria for flammability and smoke emission characteristics specified in this part. For instance, a railroad may need to use material possessing certain functional characteristics, such as flexibility, even though the material is otherwise unavailable in a form complying with this part's flammability and smoke emission requirements.

Should it be necessary to file a waiver petition for use of material not complying with this part's flammability or smoke emission requirements, or both, 49 CFR 211.9(c) requires in particular that sufficient information, including relevant safety information, be provided to support the request. FRA would expect that each such petition include a fire safety analysis demonstrating that use of the material is consistent with railroad safety by not creating an unacceptable risk of injury to passengers and crewmembers. In making such a showing, the analysis should consider the material's size, location, exposure to potential ignition sources, contribution to flame spread and smoke emission, and variation from the test performance criteria specified in this part; the railroad's operating environment; the presence or absence of heat/smoke detection and fire suppression systems; and the availability of rapid and safe egress to the exterior of the vehicle under conditions secure from fire, smoke, and other hazards. As railroads are already required by § 238.103 to conduct fire safety analyses of both their existing and new passenger cars and locomotives, such an analysis should generally not impose a new burden on railroads in filing waiver requests. FRA would expect that a railroad submit its fire safety analyses of its existing and new passenger cars and locomotives, as

appropriate, with a waiver petition to justify the use of material not complying with the flammability or smoke emission requirements of this part, or both. The fire safety analyses required by § 238.103 evaluate the safety of the rail equipment as a whole, and thereby help place in context the use of the material that is the subject of the waiver request.

Subpart B—Safety Planning and General Requirements

Section 238.103 Fire Safety

This section specifies the fire safety analysis requirements for passenger cars and locomotives, as well as the requirements for the materials used in this equipment.

Paragraph (a). Paragraph (a)(1) concerns the fire safety requirements for the materials used in constructing passenger cars and cabs of locomotives ordered on or after September 8, 2000, or placed in service for the first time on or after September 9, 2002. These materials are required to meet the test performance criteria for flammability and smoke emission characteristics specified in Appendix B, or alternative standards issued or recognized by an expert consensus organization after special approval of FRA under § 238.21. Even though this paragraph remains unchanged from the final rule, FRA makes clear that ''materials used in constructing a passenger car or a cab of a locomotive'' include materials used in objects that are either permanently or semi-permanently attached to the car or locomotive cab structure. Such objects are in effect part of the equipment-in distinction to luggage and other transient objects that passengers and crewmembers bring onto and remove from the equipment. Should it be necessary to file a waiver petition for use of material not complying with this part's flammability or smoke emission requirements, or both, please see the discussion of § 238.7, above.

Paragraph (a)(2) concerns the fire safety requirements for materials introduced in a passenger car or a locomotive cab on or after November 8, 1999, as part of any kind of rebuild, refurbishment, or overhaul of the car or cab. These materials are required to meet the test performance criteria for flammability and smoke emission characteristics specified in Appendix B, or alternative standards issued or recognized by an expert consensus organization after special approval of FRA under § 238.21.

The American Public Transportation Association (APTA) petitioned FRA for reconsideration of this section, raising concern about its member railroads' ability to meet the requirements of paragraph (a)(2) when the testing standards in Appendix B must be used to identify compliant materials. As noted in the discussion of Appendix B below, APTA and the National Railroad Passenger Corporation (Amtrak) both raised concerns with the test procedures and performance criteria in Appendix B and recommended that the prior version of the Appendix B table in the NPRM be substituted for the one contained in the final rule until an appropriate industry review is conducted. APTA believed that it would be more appropriate to permit commuter railroads to continue using their existing inventories of replacement materials until those inventories were depleted, unless the materials pose an unacceptable risk to safety, and to prohibit new purchases of non-compliant materials effective November 8, 1999, as evaluated by the NPRM table. APTA stated that the public procurement regulations that its member railroads operate under generally require them to place orders for a year's supply of materials and that this recommended change would permit them to conduct the appropriate tests of materials to facilitate an orderly transition to the rule's requirements.

By letter dated November 5, 1999, FRA responded in part to these concerns. (A copy of this letter has been placed in the public docket for this rulemaking.) For purposes of the requirements of § 238.103(a)(2), FRA explained that, for a transitional period, it would amend the rule to exclude those materials introduced in a passenger car or a locomotive cab from the test procedures and performance criteria in Appendix B that were not expressly subject to FRA's fire safety guidelines for materials selection. These guidelines (1989 FRA guidelines) were last published in the **Federal Register** on January 17, 1989, *see* 54 FR 1837, and were restated (with four typographical errors in the performance criteria column) as Appendix B to part 238 in the NPRM. (To be consistent with the 1989 FRA guidelines, the performance criteria in the NPRM for ''Panels: HVAC Ducting'' should have read ''Ds (4.0) ≤100''; ''Flooring: Covering'' should have read ''CRF ≥0.5 w/cm^2''; ''Insulation: Thermal'' should have read ''Ds (4.0) ≤100''; and ''Insulation: Acoustic'' should have read ''Ds (4.0) ≤100,'' as well.) FRA learned that passenger railroads, acting in good faith, may have been unable to comply with § 238.103(a)(2) as written because of difficulty obtaining certain materials—or certification for these materials, or both—subject to the requirements of Appendix B that were not expressly covered by the 1989 FRA guidelines. FRA acquired particular information in this regard at an October 6, 1999 meeting of APTA's PRESS (Passenger Rail Equipment Safety Standards) Passenger Systems Group, Fire Safety Subgroup. (The minutes of this meeting, as prepared by a designee of the group, have been placed in the public docket for this rulemaking.)

Based on this understanding, FRA believed that it would be appropriate to specify a longer transitional period than that provided in the rule (originally 180 days from the date of publication) to allow railroads to obtain materials from their suppliers—and certification for the materials—complying with the fire safety requirements. Consequently, FRA stated that it would amend the rule to include, on a transitional basis, a new appendix to the rule, designated as Appendix B1, comprising Appendix B to part 238 in the NPRM as corrected. This would have effectively codified the 1989 FRA guidelines. FRA explained that the rule would provide that on or after November 8, 1999, and for this transitional period only, materials that were introduced in a passenger car or a locomotive cab as part of any kind of rebuild, refurbishment, or overhaul of the car or cab meet the test performance criteria for flammability and smoke emission characteristics as specified in Appendix B or B1 to part 238; or alternative standards issued or recognized by an expert consensus organization after special approval by FRA under § 238.21. FRA made clear that a railroad would be required to follow the test performance criteria for materials in either one of the appendices or the other, as a whole, during this period—and not choose between the appendices for different materials—in order to retain the appendices' integrity. By permitting the use of Appendix B1 during this period, FRA expected to minimize the impact on railroads acting in good faith to comply with the final rule. FRA explained that responsible railroads that had followed the 1989 FRA guidelines all along in purchasing materials for their passenger fleets should seemingly not have had difficulty complying with § 238.103(a)(2) as FRA announced it would be amended.

Since issuing the November 5, 1999 letter, FRA has reexamined this issue in general and has decided not to issue an Appendix B1. As explained below, FRA is amending Appendix B to address the principal concern of passenger railroads that, through the final rule, FRA had imposed requirements on materials that

were not expressly covered by the 1989 FRA guidelines. FRA believes that these amendments eliminate the need to add an Appendix B1. Furthermore, the presence of two appendices could add confusion at a time when FRA is attempting to make the fire safety requirements easier to understand and follow. Therefore, paragraph (a)(2) remains unchanged from the final rule. Should these technical assumptions prove incorrect for reasons FRA does not presently apprehend, FRA will take further action, as appropriate, to provide the requested relief.

FRA is adding paragraph (a)(3) to ensure that railroads may rely on the results of tests of materials conducted in accordance with the standards and performance criteria for flammabilitiy and smoke emission characteristics as specified in Appendix B to part 238 of the May 12, 1999 final rule, which took effect on July 12, 1999. FRA recognizes that materials have already been installed in passenger cars and locomotives in reliance on the requirements of the final rule, and other materials are now held in inventory or have otherwise been ordered in reliance on the requirements of the final rule. Accordingly, for purposes of complying with the requirements of paragraphs (a)(1) and (2), a railroad may rely on the results of tests of material conducted in accordance with the standards and performance criteria for flammabilitiy and smoke emission characteristics as specified in Appendix B to this part in effect on July 12, 1999, if prior to June 25, 2002 the material is installed in a passenger car or locomotive, held in inventory by the railroad, or ordered by the railroad.

FRA is amending the test standards and performance criteria in Appendix B in two principal ways that necessitate adding this paragraph. First, as discussed below, FRA is updating Appendix B to incorporate newer versions of the test standards referenced therein that have been published since the final rule was promulgated. FRA is therefore making provision for railroads to rely on the results of tests using the earlier versions of the test standards as referenced in Appendix B of the May 12, 1999 final rule. Further, as discussed below, FRA is amending Appendix B to restore the function of material subcategories for thermal and acoustic insulation, as well as for HVAC ducting, that were proposed in the NPRM and contained in the 1989 FRA guidelines. Because restoration of these subcategories results in stricter performance criteria for these materials than specified in the May 12, 1999 final rule, FRA is also making provision for railroads to rely on the results of tests of these materials conducted in accordance with the standards and performance criteria as specified in Appendix B of the May 12, 1999 final rule. As noted above, use of these test results is limited to material that is installed in a passenger car or locomotive, held in inventory by the railroad, or ordered by the railroad prior to June 25, 2002.

Paragraph (b). This paragraph requires railroads to obtain certification that a representative sample of combustible materials to be used in constructing passenger cars and locomotive cabs or introduced into such equipment as part of any kind of rebuild, refurbishment, or overhaul of the equipment has been tested and complies with the fire safety requirements of paragraph (a) at the time it was tested. Although the paragraph remains unchanged from the final rule, concern has been raised whether a material must be retested to show compliance with the required test performance criteria when such material has previously passed an earlier version of a specified test procedure. As a result, FRA makes clear that re-certification of the material is not necessary if the test procedure(s) and performance criteria used to evaluate the material are not less stringent than the ones applicable to the material through the requirements of paragraph (a). Of course, FRA is concerned that the test results reflect the performance of the actual material used in the passenger car or locomotive cab—rather than reflect outdated material composition. Consequently, in Phase II of the rulemaking FRA will consider whether use of tests results should be limited to tests of materials conducted within a certain number of years.

Paragraph (c). This paragraph specifies the fire safety analysis requirements for procuring new passenger cars and locomotives. FRA is amending the heading of this paragraph to reflect the focus on passenger car and locomotive fire safety, consistent with the requirements in paragraph (a), instead of on all passenger equipment generally. FRA has likewise amended paragraph (d), below. FRA is removing the express requirement for railroads to reduce the risk of ''equipment damage'' caused by fire to an acceptable level in conducting their analyses, as stated in the final rule. *See* 64 FR 25670. FRA's chief concern is that railroads reduce the risk of personal injury caused by fire to an acceptable level, as required by the final rule, even if the equipment is damaged in the process. At the same time, FRA is amending paragraph (c) to make clear that, in ensuring that fire safety considerations and features in the design of new passenger cars and locomotives reduce the risk of personal injury caused by fire to an acceptable level as determined by the railroad, each railroad must consider the operating environment in which this equipment will operate. Railroads must consider the presence of other passenger equipment (*e.g.,* a baggage or private car) that operates in the same trains with the passenger cars and locomotives for purposes of evaluating passenger car and locomotive occupant safety. Yet, the focus of the required analysis is not on the safety of the other passenger equipment itself. Further, in considering the operating environment of the passenger cars and locomotives, railroads must pay particular attention to whether the equipment will operate in tunnels or on elevated structures where passenger egress from—and emergency response access to—the equipment is restricted.

FRA notes that the final rule cited MIL–STD–882C, ''System Safety Program Requirements,'' as a formal safety methodology to guide railroads in reducing the risks of personal injuries caused by fire to an acceptable level. MIL–STD–882 was updated on February 10, 2000, and designated as MIL–STD–882D, ''Standard Practice for System Safety,'' superceding MIL–STD–882C. Consequently, FRA is amending the rule to remove the ''C'' designation to make clear that a railroad may use MIL–STD–882D or another formal safety methodology as a guide in reducing such risks. Further, as a general matter, FRA makes clear that a railroad is not required to reduce the risk of personal injuries to zero in order to comply with paragraph (c), as such a requirement would be impractical.

FRA is also making some changes to paragraph (c) largely for organizational consistency and clarity. First, FRA is re-designating paragraph (c)(2) of the final rule as paragraph (c)(1). Next, FRA has partially merged paragraphs (c)(1) and (c)(8) of the final rule into one paragraph, as both are related, and is designating that paragraph as (c)(2). FRA recognizes that, as stated in the final rule, a railroad acting in good faith may have been unable to comply with the requirements of paragraph (c)(1) and that the text of paragraph (c)(8) more appropriately stated FRA's intent. Moreover, FRA is making clear in revised paragraph (c)(2) that in protecting the equipment's occupants from fire, preventing a fire in the first place is logically the first priority of a railroad. Further, FRA is making clear in revised paragraph (c)(2) that in conducting their analyses of new equipment railroads consider, among

other factors, potential ignition sources; the type, quantity, and location of the materials used in the equipment; and availability of rapid and safe egress to the exterior of the equipment under conditions secure from fire, smoke, and other hazards. These considerations, among others, are expressly stated in paragraph (d) for purposes of analyzing existing passenger equipment, and logically apply in conducting analyses of new equipment as well. FRA is correcting paragraph (c)(7) by deleting the phrase ''the railroad shall'' so that it is more consistent with the structure of the other items in paragraph (c). Further, FRA is re-designating paragraph (c)(9) of the final rule as paragraph (c)(8), removing the express requirement to address ''cost and performance issues'' and instead focusing the paragraph exclusively on safety issues, and adding the words ''selection of materials'' to make clear that selecting materials is part of the design process. FRA is also revising paragraph (c)(8) of the final rule due to the partial merger of final rule paragraphs (c)(1) and (c)(8), and re-designating the paragraph as (c)(9). Paragraph (c) requires that the fire safety analysis be in writing, and paragraph (c)(9) further serves to make this clear.

Paragraph (d). This paragraph specifies the fire safety analysis requirements for existing railroad passenger cars and locomotives. As noted above, FRA is amending this paragraph to reflect the focus on passenger car and locomotive fire safety, consistent with the requirements in paragraph (a), instead of on all passenger equipment generally. Accordingly, in the heading to paragraph (d) and throughout paragraphs (d)(1)–(5), FRA has substituted the phrase ''passenger cars and locomotives'' for ''passenger equipment'' and ''equipment,'' as appropriate. Railroads must consider the presence of other passenger equipment (*e.g.,* a baggage or private car) that operates in the same trains with the passenger cars and locomotives for purposes of evaluating passenger car and locomotive occupant safety. Yet, the focus of the required analyses is not on the safety of the other passenger equipment itself.

As provided in the final rule, each passenger railroad was required to complete a preliminary fire safety analysis for each category of its existing rail equipment and rail service no later than July 10, 2000. For any category of equipment and service identified during the preliminary fire safety analysis as likely presenting an unacceptable risk of personal injury, the final rule required a full analysis and any necessary remedial action to abate such unacceptable risks no later than July 10, 2001. The final rule further required a full fire safety analysis for all categories of equipment and service, and any necessary remedial action to abate unacceptable risks of personal injury, no later than July 10, 2003.

APTA petitioned FRA for reconsideration of this paragraph, stating that FRA had provided little guidance as to what constitutes good practice for performing fire safety analyses and how to classify a risk as acceptable or not. APTA's petition explained that these are necessarily somewhat subjective judgments and that railroads would need additional guidance in making these determinations—particularly those railroads without in-house engineering staffs. APTA recommended that FRA grant the industry an additional six months to develop a recommended practice for performing fire safety analyses in order to provide for more consistency across the industry, and volunteered its PRESS Task Force to work expeditiously to complete a suitable standard practice. APTA committed that, during this additional six months, commuter railroads would begin reviewing maintenance records to identify car components that have a history of incidents that could indicate a fire hazard and conduct a top-level review of railcar interiors to identify items of potential risk.

By letter dated October 8, 1999, FRA announced that it would amend the rule to provide railroads an additional six months (until January 10, 2001) to complete the preliminary fire safety analysis for each category of existing rail equipment and service as required by § 238.103(d)(1). (A copy of this letter to APTA has been placed in the public docket for this rulemaking.) This **Federal Register** notice amends the rule accordingly. For any category of existing passenger cars and locomotives and rail service identified in the preliminary fire safety analysis as likely presenting an unacceptable risk of personal injury, § 238.103(d)(2) continues to require railroads to have completed a full analysis and taken any necessary remedial action to abate unacceptable risks no later than July 10, 2001. Further, § 238.103(d)(3) continues to require railroads to complete a full fire safety analysis for all categories of existing passenger cars and locomotives and rail service, and take any necessary remedial action to abate unacceptable risks no later than July 10, 2003. Railroads may complete any necessary remedial action required by paragraph (d) ahead of the deadlines for taking such action; FRA has encouraged railroads to do so as resources permit.

FRA and Volpe National Transportation Systems Center (Volpe Center) staff have served as advisors to the APTA PRESS Fire Safety Subgroup of the Passenger Systems Group that focused on developing a model fire safety analysis to guide railroads in complying with paragraph (d) and more uniformly implement its requirements across the nation's passenger railroads. From FRA's initial involvement with the Subgroup following publication of the final rule, FRA learned that most commuter railroads intended to conduct full fire safety analyses for all categories of their rail equipment and service by the date required in paragraph (d)(1), instead of availing themselves of the additional time provided by paragraphs (d)(2) and (3) to complete the analyses in stages. FRA had recognized the efficiency of the commuter railroads' intended approach but structured the rule to require railroads to focus more immediately on apparent personal injury risks uncovered by preliminary fire safety analyses and then address such risks before requiring them to complete more detailed fire safety analyses on all their equipment and rail service. Nevertheless, FRA makes clear that a railroad, to be in compliance with the rule as amended, need have performed only one fire safety analysis if it was completed by January 10, 2001, and fully covered all categories of the railroad's passenger cars and locomotives and rail service.

On November 1, 2000, the APTA Press Task Force approved ''Recommended Practice for Fire Safety Analysis of Existing Passenger Rail Equipment,'' APTA–RP–PS–005–00. (A copy of this document as approved by APTA's Commuter Rail Executive Committee on January 8, 2001, has been placed in the public docket for this rulemaking.) In addition to guiding railroads in complying with paragraph (d), this recommended practice is also intended to be incorporated into the passenger railroads' system safety programs as a permanent safety tool. Among other things, the recommended practice helps to differentiate between levels of personal injury risks for purposes of taking remedial action to reduce those risks, as appropriate.

Nevertheless, as to APTA's concern that FRA had provided little guidance in the rule as to what constitutes good practice for performing fire safety analyses and how to classify a personal injury risk as acceptable or not, FRA referred APTA in the October 8, 1999 letter to the definition of a category of

rail equipment and current rail service for purposes of paragraph (d). As stated in paragraph (d)(5), as amended, a ''category of existing passenger cars and locomotives and rail service'' is itself dependent on an analysis that includes consideration of relevant fire safety risks, such as available ignition sources, presence or absence of heat/smoke detection and fire suppression systems, known variations from the required material test performance criteria or alternative standards approved by FRA, and availability of rapid and safe egress to the exterior of a vehicle under conditions secure from fire, smoke, and other hazards. As a result, any analysis required under paragraph (d) must include these considerations, albeit to differing and progressively greater degrees of scrutiny to comply with the requirements of paragraphs (d)(1) through (3). Additionally, paragraph (d) provides that a railroad is not required to replace material found not to comply with the test performance criteria for flammability and smoke emission characteristics required by part 238 if the risk of personal injuries from the material is negligible based on the railroad's operating environment and the material's size, or location, or both. (See paragraphs (d)(2)(ii)(A) and (d)(3)(ii)(A).) FRA also makes clear that a railroad is not required to reduce the risk of personal injuries to zero in order to comply with paragraph (d), as such a requirement would be impractical. Moreover, as FRA explained in its October 8, 1999 letter, railroads should consider, as appropriate, the elements contained in paragraph (c) for purposes of analyzing the fire safety of their existing rail equipment under paragraph (d). Paragraph (c) specifies fire safety analysis considerations that reflect good, commonly used engineering practices.

Appendix B—Test Methods and Performance Criteria for the Flammability and Smoke Emission Characteristics of Materials Used in Passenger Cars and Locomotive Cabs

The test standards and performance criteria in this Appendix are based on guidelines originally developed by the Volpe Center for the Urban Mass Transportation Administration (now the Federal Transit Administration) in the 1970s, and last published by FRA in 1989. In the NPRM, FRA generally proposed making the 1989 FRA guidelines mandatory for materials used in the construction of new railroad passenger equipment as well as in the refurbishment of existing equipment. *See* 62 FR 49803. In the final rule, FRA revised the table of test methods and performance criteria for the flammability and smoke emission characteristics of materials used in railroad passenger cars and locomotive cabs, and clarified the application of the required tests and performance criteria as well. *See* 64 FR 25555. In issuing the final rule, FRA sought to maintain the high level of safety provided by FRA's 1989 guidelines while addressing concerns related to their adoption as a regulation. *See* 64 FR 25647.

As noted above in the discussion of § 238.103(a)(2), APTA's petition for reconsideration raised concern with the table of test methods and performance criteria contained in Appendix B, stating that the final rule contains several changes but fails to explain why these changes were made and that the changes were not approved by the National Fire Protection Association (NFPA). APTA raised particular concern that the final rule would degrade safety standards for smoke densities and flame spread in several areas, and did not wish to adopt changes that would reduce passenger and employee safety. APTA believed that without more data concerning the impact of the final rule's standards on safety and rail car design, and until the industry completes its review, the standards presented in the NPRM should be adopted instead. APTA added that consideration of new fire safety test methods and performance criteria should be identified as the first item in Phase II of the rulemaking. Amtrak likewise stated that the NPRM table was technically appropriate but that changes made in the final rule appeared to have caused substantial, unintended results. Amtrak recommended that FRA revert to using the NPRM table pending an appropriate industry review of the table contained in the final rule. Bombardier Transportation (Bombardier) similarly recommended in its petition for reconsideration that FRA return to the specific standards proposed in the NPRM and make any refinements in Phase II of the rulemaking. Bombardier raised particular concern that the final rule covered all materials used in constructing or refurbishing passenger cars and locomotive cabs, and was not limited to materials used in constructing or refurbishing the interiors of such equipment.

In response to these petitions as a whole, FRA has decided not to revert in full to the 1989 guidelines as they appeared in Appendix B of the NPRM. To do so would cause the removal of Note 3 of the final rule, for instance, which provides for the testing of seat and mattress assemblies as integrated units to alternative test performance criteria. As discussed below, seat assemblies tested in such manner have been placed in Amtrak's Acela trainsets. Nevertheless, FRA has revised Appendix B and believes that these revisions effectively address the principal concerns raised by these petitioners, while at the same time retaining elements of the final rule related to the adoption of the guidelines as an FRA regulation. The revisions to Appendix B are discussed in detail below.

FRA notes that the requirements of Appendix B should be considered in light of the fire safety requirements specified in § 238.103 as a whole, which together comprise different aspects of a systems approach to fire safety. This systems approach incorporates basic, generally accepted fire protection engineering practices and principles, and is consistent with the advisory text included by the American Society for Testing and Materials (ASTM) in introducing its test procedures that are referenced in Appendix B. The ASTM cautions that test results ''should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions.'' The ASTM also advises that the test results ''may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.''

FRA believes that the test performance criteria specified in Appendix B provide important information as to the resistance of materials to ignition, and their rates of flame spread and smoke emission, albeit under controlled conditions. This information should not be examined in a ''vacuum'' but rather as part of a fire safety analysis of a passenger rail vehicle in its end use, such as that required for new passenger cars and locomotives by § 238.103(c). Nevertheless, the use of materials complying with the requirements of Appendix B serves to limit the overall risk of fire in a vehicle and promote the time available for passenger and crew evacuation if a fire does occur. FRA intends to evaluate in Phase II of the rulemaking whether alternative test methods and performance criteria should be specified for all materials in Appendix B. The National Institute of Standards and Technology (NIST), on behalf of FRA, is investigating the use

of alternative testing methodologies and computer hazard analysis models to identify and evaluate approaches to passenger train fire safety. *See* 64 FR 25554. As FRA has explained, NIST has previously found that individual components of a passenger rail car may perform differently in an actual fire from that experienced in small-scale tests (particularly when large ignition sources are involved) due to vehicle geometry and materials interaction. *Id.*

FRA's use of standards established by other organizations, such as ASTM, is a means of establishing technical requirements without increasing the volume of the Code of Federal Regulations. *See* 1 CFR part 51. Following publication of the final rule, ASTM advised FRA that it had updated certain of its test standards that are referenced in the rule. For example, ASTM standard E 662–97 (the 1997 version of standard E 662) was incorporated into the May 12, 1999 final rule; the newer version of this ASTM standard is E 662–01 (the 2001 version of standard E 662). The newer version of the standard bears the same general technical content as the standard currently incorporated but has been reviewed by an ASTM committee and revised. In other cases, ASTM has reviewed standards and affirmed them as unchanged. During the review of the standards, changes occur-or not-by consensus of ASTM committee members. This process provides the opportunity for members of industry, government, and academia to participate, and FRA considers the updated standards to have been adequately reviewed and be technically sound.

FRA is incorporating by reference such updated ASTM test standards into the rule. In addition to ASTM E 662, these updated standards consist of ASTM C 1166, ASTM D 3675, ASTM E 119, ASTM E 648, ASTM E 1354, and ASTM E 1537. FRA understands that industry practice is to use the updated versions of the ASTM standards. Since Federal law requires that a publication incorporated by reference be identified by its title, date, edition, author, publisher, and identification number, *see* 1 CFR 51.9(b)(2), FRA is amending the rule to incorporate the updated standards so as to expressly permit their use. Further, FRA intends to regularly update the rule to incorporate newer versions of the test standards referenced herein, as they are periodically revised. Nevertheless, as discussed in detail above, FRA is adding paragraph (a)(3) to provide a means for railroads, under certain conditions, to rely on the results of tests conducted using the earlier versions of the ASTM standards as cited in the May 12, 1999 final rule for the purpose of showing compliance with the requirements of Appendix B.

FRA notes that LTK Engineering Services (LTK) also petitioned for reconsideration of the fire safety standards, raising a number of specific issues which are identified below. LTK explained that very few materials were capable of meeting the 1989 FRA (and earlier FTA and FRA) guidelines when they were first published, but since that time products intended for use in railcars have been reformulated to meet and often exceed the performance criteria. LTK raised concern that the final rule did not seem to reflect the improvements made to materials over the past 20 years and placed no burden on the industry to improve further the performance of the materials. LTK stated that, over the years, it has witnessed many attempts by product manufacturers to provide rail car buyers with materials of lesser quality and performance, and believed that the new regulations would perpetuate this practice.

Bay State Marketing Consultants (Bay State) raised similar concerns in a petition for reconsideration, noting that products such as seat foam, elastomers, thermal and acoustic insulation, vacuum foaming and wall lining materials have been reformulated to exceed the 1989 FRA guidelines. Bay State believed that the final rule ignores the improved materials and products on the market today, and reflects an essential unfamiliarity with both the relevance of the test methods and the operating environment encountered by the majority of passenger rail cars, such as those operating in the New York City tunnel system. Specifically, the petitioner believed that the rule should be continually revised until all products used in rail car construction comply with a smoke (or specific optical) density limit (Ds) of 100 at 4 minutes using the ASTM E 662 test procedure. The petitioner stated that an acceptance level of 200 provides little protection, and maintained that the smoke emitted from one fully combusted window mask complying with a Ds of 200 will completely obscure human vision beyond a distance of two feet, disabling people and preventing them from locating emergency exits. The petitioner believed that the standard would not be tolerated by anyone who actually stood in a room with such a smoke density.

As FRA has explained, the final rule is the first of a two-phased rulemaking. *See* 64 FR 25554. In the second phase, FRA will examine the need for further refinements to the test procedures and performance criteria following, in particular, a review of the results of ongoing fire safety research conduct by NIST. FRA has acknowledged that since the FRA guidelines were originally developed in the 1970s, a greater number of materials has become available that exceed the stated test performance criteria. Had FRA made the test performance criteria in the final rule more stringent on the basis of the concerns raised by these two petitioners, the final rule would indeed have been a marked departure from the NPRM. However, this was not the case.

LTK also raised concern that the rule specifies no requirements for the toxicity of gasses emitted from burning materials, noting that many commuter rail car specifications contain such requirements. FRA recognizes this concern, and has identified this as an issue to examine in Phase II of the rulemaking. FRA has not previously recommended any specific performance standards for material toxicity. However, preliminary research conducted by NIST has shown that, for currently used materials within a rail car, the heat generated by burning the materials may prove fatal to occupants before the occupants are overcome by toxic gases within the vehicle.

Cushions and Mattresses

As noted in the preamble to the final rule, ''Cushions, Mattresses'' is a new category in the table which was listed in the 1989 FRA guidelines and the NPRM under the function of material column and included under the category, ''Passenger seats, Sleeping and dining car components.'' 64 FR 25648. In its petition for reconsideration, LTK maintained that cushions and mattresses today can meet a Ds of 150 at 4 minutes—lower than the Ds of 175 in the final rule. Bay State stated in its petition that since seat foams constitute one of the major sources of fuel in a car interior, FRA should strongly consider limiting seat foam smoke emission standards generally to 150 at 4 minutes and even to 100 at 4 minutes for those vehicles operating in tunnels or on elevated structures. The petitioner noted that smoke inhalation is the major source of passenger disablement and death in a fire, and that smoke is the primary obstacle to locating emergency exits.

Because FRA did not intend to make the smoke emission performance criteria for cushions and mattresses more stringent in Phase I of this rulemaking, the final rule imposed the same smoke emission performance criteria as those recommended in the 1989 guidelines. Nonetheless, the concerns raised by

these petitioners to adopt stricter smoke emission performance criteria for cushions and mattresses merit consideration in Phase II of the rulemaking.

Note 1 remains unchanged from the final rule. Note 2 remains unchanged except for the reference to ASTM E 662–01. As discussed above, certain of the ASTM test standards referenced in the rule, such as ASTM E 662, have been updated.

As explained in the final rule, FRA has been investigating the testing of assemblies of materials for performance in a fire, rather than individually testing the materials which comprise such assemblies, to reflect more realistically the interaction of materials in a fire. *See* 64 FR 25648. As part of the FRA-sponsored fire safety research program managed by the Volpe Center, six full-scale alternative seat assemblies being considered for Amtrak's high-speed trainsets were tested in March, 1997, using a furniture calorimeter. Among other things, the test results showed that fire blocking layers can significantly prevent fire ignition and limit flame spread, fire growth, and smoke generation. Note 3 of the final rule permitted the testing of seat and mattress assemblies as an integrated unit, in the alternative to individually testing the components that comprise the seat or mattress assembly, using ASTM E 1537 (''Standard Test Method for Fire Testing of Upholstered Seating Furniture'') and the pass/fail criteria specified in California Technical Bulletin (Cal TB) 133 (''Flammability Test Procedure for Seating Furniture for Use in Public Occupancies''). FRA noted that Cal TB 133 has a successful history of use at state and municipal levels for high-hazard occupied places such as nursing homes and that results of the March, 1997 tests showed that certain seat assemblies met the Cal TB 133 test performance criteria, did not spread any flame, and exhibited low rates of heat and smoke release. *Id.* Moreover, data from Amtrak-funded tests showed that seat assemblies selected for use on Amtrak's high-speed trainsets passed both the ASTM D 3675 and Federal Aviation Administration (FAA) ''oil burner'' tests for cushions and fabrics, in addition to passing the ASTM E 1537 and E162 tests specified in the final rule.

In its petition for reconsideration, LTK expressed concern that Note 3 would allow the use of urethane materials in seat cushions and that such materials would otherwise not meet the test performance criteria for flammability and smoke emission. The petitioner believed this represented a potential fire hazard since it perceived that the rule did not require the assembly tested to continue to be subject to integrity requirements for the life of the assembly, even in the case the assembly covering (fire blocking layer(s)) were cut due to accident or vandalism. In addition, the petitioner believed that no dynamic cycling tests were imposed on seat assemblies by the final rule, adding that such tests were necessary to simulate real-world wear.

FRA stated in Note 3 that use of the alternative test performance criteria for seat and mattress assemblies is dependent on the condition of the assemblies' components remaining unchanged or, if they were replaced, possessing at least equivalent fire performance properties to the original components tested to provide for necessary quality control of the components. Further, Note 3 requires an accompanying fire hazard analysis that considers the operating environment within which seat and mattress assemblies will be used in relation to the risks of vandalism, puncture, cutting, or other such acts or external forces which may expose the individual components of the assemblies to a source of ignition. Although seats and mattresses may contain foams that would not otherwise meet the test performance criteria if tested individually, such foams are required to be protected by a robust blocking layer or layers (as used to meet FAA fire seat regulations) resistant to both fire and vandalism, puncture, cutting, and other such acts and external forces. FRA noted in the final rule that the U.S. Coast Guard has issued a Navigation and Vessel Inspection Circular (NAVIC) for structural fire protection which permits the use of fire blocking layers if tested according to Cal TB 133; the NAVIC states that these fire blocking materials have proven effective in protecting combustible foams from becoming involved in a fire. *See* 64 FR 25648, note 13. Such blocking layers must be applied in a manner which seals the seams (*e.g.,* using bonding or ceramic thread with binding tape) and ensures that the foam is not exposed to an ignition source. In evaluating the risk that the integrity of an assembly may be compromised so that its foam is exposed to an ignition source, a railroad must consider the frequency of its inspections of such assemblies to verify their condition. A fire blocking layer that is cut, torn, or punctured so that the integrity of the assembly is compromised must be repaired or replaced to ensure continued compliance with Note 3. FRA makes clear that the assembly tested continues to be subject to the requirements of Note 3 for the life of the assembly. Further, FRA has amended the rule to make clear that Notes 5, 6, 7, and 8 apply to the surface layers of seat and mattress assemblies tested in accordance with Note 3, to simulate real-world wear.

Separately, GBH International (GBH) petitioned FRA for reconsideration of Note 3, stating that mattresses cannot be tested according to the ASTM E 1537 test procedure because it is specific to chairs and sofas and the testing apparatus is too small to accommodate the mattress sample. According to the petitioner, the ASTM E 1590 test procedure is the corresponding test for mattresses. However, GBH added that it is not clear whether mattress combinations for passenger rail applications would be suitably tested by the ASTM E 1590 test procedure, maintaining that the exposure is intended for a lower risk fire environment and that a small increase in ignition source intensity can easily have a significant effect on the fire hazard. GBH therefore recommended that passenger rail mattresses be tested to the same pass-fail criteria as Cal TB 133 but with an ignition source similar to the FAA oil burner test used for aircraft seat cushion flammability in the same room environment as the ASTM E 1590 test procedure. The petitioner likewise noted that testing of seat applications in passenger rail cars will likely suffer from similar problems as the testing of mattresses and recommended using an ignition source for seat testing similar to the FAA oil burner test in the same room environment as the ASTM E 1537 test procedure using Cal TB 133 performance criteria.

FRA agrees that ASTM E 1590 is the more appropriate test procedure for a mattress assembly, and is effectively the corresponding test to ASTM E 1537 for a larger object. As a result, FRA has amended the rule to require use of the ASTM E 1590 test procedure for purposes of testing mattress assemblies in accordance with the alternative standards specified in Note 3. However, FRA has also amended the rule to require that mattress assemblies tested using the ASTM E 1590 test procedure be evaluated against the performance criteria contained in Cal TB 129—not Cal TB 133. Cal TB 129 describes performance criteria for mattress assemblies and contains, in effect, the corresponding performance criteria to those for seat assemblies in Cal TB 133. FRA recognizes that the FAA oil burner test for aircraft seat cushions, which is found at 14 CFR part 25, Appendix F,

Part II, addresses the risk of fuel-fed fires. However, FRA has noted that certain seat assemblies tested for placement in Amtrak's high-speed trainsets using the ASTM E 1537 test procedure also passed the FAA's oil burner test. In Phase II of the rulemaking, FRA will further examine the petitioner's recommendation to use the oil burner as an ignition source during the ASTM E 1537 and 1590 tests.

Note 4 remains unchanged from the final rule. FRA makes clear that Note 4 applies to both seat cushion and mattress testing.

Note 5 requires the dynamic testing of seat cushions and mattresses to help ensure that they retain their fire retardant characteristics after they have been in service for a period of time. As provided in the final rule, Note 5 expressly subjected seat cushions and mattresses to an endurance test specified in ASTM D 3574, Test I_2 (Dynamic Fatigue Test by the Roller Shear at Constant Force) or Test I_3 (Dynamic Fatigue Test by Constant Force Pounding) both using Procedure B. Following publication of the final rule, a railroad stated that the size of the samples required to be tested differed for the ASTM D 3675 flammability test procedure specified for cushions and mattresses and the ASTM D 3574 dynamic test procedure specified in Note 5. Accordingly, FRA has revised Note 5 to make the samples the same size so that flammability testing may be conducted on the same sample that has undergone dynamic testing.

Notes 6, 7, and 8 remain unchanged from the final rule. These notes, along with Note 5, are now expressly referenced in Note 3 to make clear that they apply to seat and mattress assembly testing as specified in Note 3.

Fabrics

In the final rule, the ''Fabrics'' category included fabrics used in seat upholstery, mattress ticking and covers, and curtains. These items were formerly identified in the function of material column for the category ''Passengers seats, Sleeping and dining car components'' in the 1989 FRA guidelines and the NPRM. The word ''All'' under function of material in the final rule eliminated confusion as to what must be tested; window shades, draperies and also wall coverings were required to be tested if composed of fabric. *See* 64 FR 25648–25649. Nevertheless, instead of stating that the test performance criteria apply to ''All'' fabrics, FRA has amended the table so that the criteria apply to fabrics used in or for items expressly identified in the guidelines and NPRM—that is, seat upholstery, mattress ticking and covers, and curtains—as well as in those items discussed in the preamble to the final rule—draperies, wall coverings, and window shades. This amendment is intended to make the rule more consistent with the format of FRA's fire safety guidelines, while clearly addressing the potential contribution to fire and smoke posed by fabric window shades and wall coverings, and avoiding any terminology confusion between ''curtains'' and ''draperies.''

As noted in the preamble to the final rule, the 1989 FRA guidelines limited smoke emission performance for ''coated'' fabrics, typically vinyl-based upholstery, to a Ds of 250 and ''uncoated'' fabrics to a Ds of 100—both at 4 minutes. *See* 64 FR 25649. It was determined that a uniform Ds limit of 200 at 4 minutes for smoke emission would be appropriate for both classes of fabrics, based in part on the known performance of the range of fabrics available and the definition of coated and uncoated used by the ASTM. Moreover, FRA noted that allowing a higher smoke emission performance standard for coated fabrics—more than twice that allowed for uncoated fabrics—provides an inconsistent level of safety on the basis of the fabric used and that an NFPA 130 committee had accepted a recommendation for the identical change in its own standard. *Id.*

In its petition for reconsideration, LTK raised concern that smoke emission limits for ''uncoated'' fabrics have been increased for seat upholstery, mattress ticking, covers and curtains to a Ds of 200 at 4 minutes. LTK believed that this represented a significant increase in allowable smoke emission, noting the amount of fabric (bedding, curtains, chairs) contained in a sleeping car or intercity coach. LTK stated that the original guidelines recognized the performance difference between cloth and vinyl upholstery, and that the distinction must remain. LTK did recommend changing the terminology from ''coated'' and ''uncoated'' as used in the 1989 FRA guidelines to ''cloth'' and ''vinyl,'' respectively, citing confusion and attempts by suppliers to have materials accepted at higher smoke emission levels. Bay State raised similar concerns, noting in particular that raising the smoke emission limit for cloth fabrics could double the allowable smoke emission in sleeping cars, potentially allowing the introduction of more toxic fumes.

FRA continues to believe that allowing a higher smoke emission limit for fabrics based on the type of fabric used provides an inconsistent level of safety. Further, since an ASTM test procedure is specified for evaluating smoke emission, it has been considered appropriate to use the ASTM definition of ''coated'' material, *i.e.,* a flexible material composed of a textile fabric and an adherent polymeric material applied to one or both surfaces. This definition is more inclusive than one essentially describing a ''coated'' fabric as vinyl, thereby creating the possibility that a greater number of materials would be evaluated against the higher Ds limit of 250. Moreover, as part of NIST's ongoing fire safety research, NIST evaluated test data from samples of fabrics intended for use in an Amtrak passenger car and found a variation of Ds levels from 57 to 175 at 4 minutes. (*See* ''Fire Safety of Passenger Trains: Phase I Material Evaluation (Cone Calorimeter),'' DOT/FRA/ORD–99/01–DOT–VTNSC–FRA–98–26, January 1999, cited in the final rule at 64 FR 25554, note 1.) Overall, NIST found a variation of Ds levels for all materials (not just fabrics) of between 12 and 509, with nearly half of the materials tested falling between 100 and 200. Consequently, requiring a Ds of 100 at 4 minutes may eliminate the use of many currently used materials in rail passenger cars, including certain cloth material. Although FRA is leaving the smoke emission limits unchanged from the final rule, the petitioners concerns may be examined further in Phase II of the rulemaking.

Other Vehicle Components

Through the final rule FRA established the category ''Vehicle Components'' to include the majority of those materials used in items formerly listed in the 1989 FRA guidelines and NPRM under the categories of ''Panels,'' ''Flooring'' (except structural), ''Insulation,'' ''Elastomers,'' ''Exterior Plastic Components,'' and ''Component Box Covers.'' The final rule also introduced the subcategory ''All [vehicle components] except flexible cellular foams, floor coverings, light transmitting plastics, and items addressed under other specific categories'' that effectively required all materials under the ''Vehicle Components'' category to meet specific flammability and smoke emission performance criteria, unless exempted by Note 10. Following publication of the final rule, however, passenger railroads raised concern that requiring the testing of all materials significantly departed from FRA's proposal in the NPRM.

As an initial matter, FRA is renaming the ''Vehicle Components'' category, ''Other Vehicle Components.'' Everything identified in the table is a vehicle component, of course; but FRA

is generally retaining the category's name to maintain the format of the final rule's table as far as practicable for the benefit of the regulated community.

More important, FRA recognizes that the final rule expanded the flammability and smoke emission performance testing requirements for rail car components, consistent with the intent of part 238 to cover all aspects of passenger equipment fire safety. On reconsideration, however, FRA is generally limiting the application of such test performance criteria to materials expressly identified in the 1989 FRA guidelines and the NPRM. FRA is largely doing so by amending the subcategory of ''All [vehicle components] except flexible cellular foams, floor coverings, light transmitting plastics, and items addressed under other specific categories'' to specifically identify the type of items subject to the required flammability and smoke emission test performance criteria. Most of these items were included in Note 9 to the final rule and were formerly identified in the category and function of material columns of the 1989 FRA guidelines and NPRM Appendix B table. These amendments restore these items to the body of the table following their removal due to the reorganization and streamlining of the table for purposes of the final rule. These items consist of materials used as, in, or for seat and mattress frames; wall and ceiling panels; seat and toilet shrouds; tray and other tables; partitions; shelves; opaque windscreens; end caps; roof housings; and component boxes and covers. In the final rule, Note 9 also identified ''HVAC ducting'' and ''thermal and acoustic insulation'' as items subject to testing. However, these items are now addressed elsewhere in the table due to differing test performance criteria, as discussed below.

FRA notes that it has expressly amended the rule as stated in revised Note 9 to exclude signage from any specific flammability or smoke emission test performance criteria. This exclusion applies to all signage, whether or not the signage conveys emergency or safety information or is semi-permanently affixed to the car as, *e.g.,* a wall panel. As stated in a December 13, 2000 letter to APTA and Amtrak, FRA determined that members of the public could have been confused as to whether the NPRM would make signage used in railroad passenger cars and locomotive cabs subject to specific Federal performance standards for flammability and smoke emission. (A copy of this letter has been placed in the public docket for this rulemaking.) FRA is therefore amending the rule to exclude signage from any such specific performance standards at this time, pending further public input in Phase II of the rulemaking.

None of the changes discussed above alter the pre-existing, fire safety analysis requirements of § 238.103 to consider the safety of a rail car as a whole and identify and address potential fire safety hazards, pursuant to which railroads are still required to consider the flammability and smoke emission performance characteristics of the materials that they place in their passenger equipment, including signage. As a result, railroads remain responsible for considering the fire safety characteristics of the signage that they place in their equipment to ensure that the type, size, and location of the signage, exposure of the signage to potential ignition sources, the railroad operating environment, and other factors do not create an unacceptable fire safety risk. FRA is likewise making clear elsewhere in this Notice that, pursuant to § 238.103, railroads are still required to consider the fire safety characteristics of other materials used in their passenger equipment, even if the materials are no longer specifically addressed by the requirements of Appendix B, to avoid creating an unacceptable fire safety risk. FRA intends to establish specific flammability and smoke emission performance requirements for signage in Phase II of the rulemaking.

Note 10 provides that testing of miscellaneous, discontinuous small parts is not required if such parts do not contribute materially to fire growth and the surface area of any individual small part is less than 16 square inches (100 cm^2) in end use configuration. A fire hazard analysis is required that considers both the quantity of the parts (*e.g.,* limited) and the location of the parts (*e.g.,* at discontinuous or isolated locations, or both), as well as the vulnerability of the parts to ignition and contribution to flame spread. In the preamble to the final rule, FRA cited grommets used on seats or window shades as examples of small, discontinuous parts that present an insignificant fire threat and could logically and safely be exempted from testing. *See* 64 FR 25649. In contrast, FRA explained that materials such as those used to produce wire ties of which hundreds or thousands may be included in a single car to mount power and low voltage cable bundles are not exempted from testing. *Id.*

In its petition for reconsideration, LTK advised against describing a small part by its surface area alone (less than or equal to 16 square inches) and recommended that mass also be considered, citing the number of wire ties in a rail car. Bay State shared LTK's concern, noting in particular that tie wraps for wires number in the thousands in a rail car and are fabricated for the general construction industry from polymers that exhibit flaming running and dripping. The petitioner also stated that the rule should set a total limit on the weight of unregulated elastomeric material permitted per vehicle, noting that elastomers can emit a significant amount of smoke when combusted. However, neither petitioner recommended any specific limits relating to weight or mass. In contrast to the concern of these petitioners, Bombardier stated in its petition for reconsideration that it is unclear how such small individual parts like tie wraps that are distributed throughout a rail car can play such a significant role as to contribute to a localized fire.

FRA makes clear that consideration of the mass of small parts for purposes of Note 10 is required by the fire hazard analysis specified in the Note. However, FRA has not imposed a more specific requirement concerning the weight or mass of small parts, and thus will continue to allow a railroad to make an appropriate determination based on its own fire hazard analysis. As a separate matter, due to the revisions to the table, ties that are used to bundle, wrap, or, literally, tie wires and cables are no longer subject to the flammability and smoke emission standards specified in Appendix B. Nevertheless, use of such ties shall continue to be evaluated by a railroad, as appropriate, in accordance with the fire safety analysis requirements in § 238.103. FRA is concerned about the sheer numbers of such ties in a rail car and their potential to ignite other materials and contribute to fire growth, overall. Such ties are commonly made of plastic, because of plastic's non-conductive nature, and may also be made of other material such as cloth.

In the final rule Note 11 was intended to permit use of the ASTM E 1354 test procedure to measure flammability characteristics for small parts as an alternative to the test procedures otherwise specified in the table for measuring flammability characteristics, such as ASTM E 162. Consequently, the use of the word ''shall,'' instead of ''may,'' in Note 11 of the final rule, was incorrect. The ASTM E 1354 test procedure is only intended to be an alternative—not a required-test procedure. FRA has amended the rule accordingly. In addition, FRA has merged Note 12 of the final rule with Note 11. Note 12 permitted use of the

ASTM E 1354 test procedure to measure smoke generation for small, discontinuous parts as an alternative to the ASTM E 662 test procedure otherwise specified in the table. *See* 64 FR 25703. As amended, Note 11 more clearly states FRA's intent to permit use of the ASTM E 1354 test procedure for small parts as an alternative to both the flammability and smoke emission test procedures otherwise specified in the table. Such small parts may be evaluated for flammability and smoke emission according to either Note 11, as amended, or the test procedures otherwise specified in the table. Of course, small parts may be exempt from testing pursuant to Note 10.

The test procedure referenced in Note 11 is ASTM E 1354, ''Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter'' (*i.e.,* Cone Calorimeter). This measures heat release rate at a prescribed heat flux using oxygen depletion techniques and produces information including data for time of ignition (t_{ig}) and peak heat release rate ($\dot{q}''_{max}$). The quotient of $t_{ig}/\dot{q}''_{max}$ has been evaluated as part of the current FRA-funded NIST research program, as well as in other research, and has been shown to reliably predict ignitability. Ignitability is an important consideration for certain small parts used in rail passenger cars. Because of their small size and end uses, small parts may be more significant from an ignition perspective than from a flame spread perspective. *See* 64 FR 25649. The final rule required that small parts tested in accordance with ASTM E 1354 meet the pass/fail criterion: $t_{ig}/\dot{q}''_{max}$ is less than or equal to 1.5 under stipulated exposure conditions.

In its petition for reconsideration, Bombardier noted that a material that neither ignites nor burns would nevertheless fail the performance criterion specified in Note 11 of the final rule. According to Bombardier, if the time to ignition (t_{ig}) approaches infinity (*i.e.,* does not ignite) and the peak heat release rate ($\dot{q}''_{max}$) is minimal (*i.e.,* does not burn) then the ratio $t_{ig}/\dot{q}''_{max}$ becomes significantly larger than 1.5. Bombardier therefore recommended revising this performance criterion and proposed other changes to Note 11. In its petition for reconsideration, GBH pointed out that the performance criterion cited in Note 11 was proper except that FRA had inverted a key figure, recommending that materials tested in accordance with ASTM E 1354 should meet the performance criterion: $t_{ig}/\dot{q}''_{max}$ is greater than or equal to 1.5, not less than or equal to 1.5.

FRA agrees that the performance criterion was incorrectly stated in Note 11 and has revised the Note accordingly. As amended, Note 11 states that materials tested in accordance with ASTM E 1354 shall meet the heat release rate performance criterion of $\dot{q}''_{180} \leq 100$ kW/m^2. That is, the average heat release rate over 180 seconds ($\dot{q}''_{180}$) shall be less than or equal to 100 kilowatts per square meter. This heat release rate criterion, and the smoke emission criterion discussed below, are based on the results of NIST research on a range of materials in current use in passenger rail cars as part of Phase I of the FRA-sponsored fire safety research study of passenger rail cars, discussed above and at 64 FR 25554. These performance criteria use comparable measures to the 1989 FRA guideline and NPRM performance criteria. For all of the materials tested by NIST which met the original guideline criteria, the average heat release rate over a 180-second period was 86 kW/m^2. Consequently, FRA believes that specifying a heat release rate acceptance criterion of $\dot{q}''_{180} \leq 100$ kW/m^2 is appropriate for testing materials used in small parts. FRA has amended the rule accordingly.

As noted above, FRA has combined Note 12 of the final rule with Note 11 since the intent is to permit the testing of small parts using ASTM E 1354 as an alternative to both ASTM E 162 (or the flammability test procedure otherwise specified in the table) and ASTM E 662 for smoke generation. In their petitions for reconsideration, Bombardier and LTK observed that Note 12 in the final rule did not define a pass/fail criterion for smoke generation using the ASTM E 1354 test procedure. In addition, Bay State maintained in its petition that ASTM E 1354 should not be used to measure smoke generation until its results are correlated with ASTM E 662 or the FRA provides an acceptance standard. Nevertheless, the petitioner did state that ASTM E 1354 should be adopted as a governing standard in that it provides qualitative heat release and smoke emission data.

FRA acknowledges that the final rule did not expressly define a pass/fail criterion for smoke generation of small parts in Note 12. ASTM E 1354 smoke generation data is stated in terms of ''specific extinction area,'' which is a measure of the attenuation of light by soot particles in a flowing system using a monochromatic light beam. The primary benefit of specific extinction area is that it can be used in calculations of smoke density (and thus visibility) within a passenger car for purposes of an emergency evacuation. Specific optical density cannot be used as effectively in this way. As part of the NIST research using the ASTM E 1354 test procedure to evaluate materials used in passenger rail cars, discussed above, NIST found that for all of the materials tested which met the 1989 FRA guideline criteria, the average specific extinction area (σ_f) over a 180-second period was 468 m^2/kg. Consequently, FRA believes that limiting the overall average specific extinction area in this time period to 500 m^2/kg is appropriate for testing materials used in small parts. FRA has amended the rule accordingly to specify this pass/fail criterion. FRA notes that, while it should be possible to correlate specific extinction area data with specific optical density data from the ASTM E 662 test procedure, FRA believes that it is premature to do so here but will consider it in Phase II of the rulemaking.

Finally, GBH stated in its petition for reconsideration that if floor coverings are to be tested using the ASTM E 1354 test procedure, the applied heat flux should not be 50 kW/m^2 as specified in Note 11. The petitioner maintained that such a heat flux will not be encountered by a floor environment until well after flashover, which the petitioner defined as the moment when the heat flux to the floor reaches 20 or 25 kW/m^2. According to the petitioner, a more realistic heat flux would be 25 kW/m^2, which can be encountered by floor covering materials just when flashover occurs and is consistent with studies of fire performance of carpeting materials. FRA believes that because use of the ASTM E 1354 test procedure in Note 11 is limited to materials less than 16 square inches in end use configuration and floor covering in a passenger car or a locomotive cab will most likely have a greater surface area in end use, it is unlikely that the option to use the ASTM E 1354 test procedure will apply to the testing of floor covering. As a separate mater, FRA notes that the requirement for a retainer frame for specimens tested according to ASTM E 1354 was inadvertently omitted from the final rule. FRA has amended the rule accordingly.

Flexible Cellular Foams Used in Armrests and Seat Padding; Thermal and Acoustic Insulation; and HVAC Ducting

In the final rule, flexible cellular foam products not used for cushion and mattress applications were included in the ''Flexible cellular foams'' subcategory to address their unique fire-related properties. These foam products are used for armrests, seatback ''crash''

padding, and thermal and acoustic insulation. In the preamble to the final rule, FRA noted in particular that NIST researchers in 1983 had found that foam armrests assisted flame spread from seat cushions to wall liners, and Note 8 of the 1989 FRA guidelines recommended that foam armrests be tested to the same performance criteria applicable to seat cushions to limit flame spread. *See* 64 FR 25649–50. Thermal and acoustic insulation materials not made from flexible cellular foams were permitted to be tested under the final rule to the less stringent test performance criteria applicable to the ''All [vehicle components] except flexible cellular foams * * *'' subcategory. *See* 64 FR 25702. Thermal and acoustic insulation materials were previously included as a separate category in the 1989 FRA guidelines with a recommended smoke emission (Ds) limit at 4 minutes of 100 using the ASTM E 662 test procedure. However, the NPRM did not expressly propose a smoke emission limit at 4 minutes for thermal and acoustic insulation materials, *see* 62 FR 49823, and FRA incorrectly stated in the final rule that the Ds limit for these materials at 4 minutes was intended to be 200 in the NPRM, when it should have been 100 to be consistent with the guidelines.

In their petitions for reconsideration, LTK and Bay State raised concern that FRA had degraded the test performance criteria for car body insulation from the 1989 FRA guidelines. Noting in particular the potential doubling of allowable smoke emission, the petitioners believed this to be significant because car body insulation represents a substantial amount of material in a railcar's floors, walls, ceilings, and air distribution ducts. They also found equally troubling that the smoke emission limit for HVAC ducting had been doubled from the guidelines as well, citing the importance of limiting the amount of smoke generated by a ventilation system in order to prevent the spread of smoke throughout a car. The final rule permitted HVAC ducting to have a Ds limit at 4 minutes of 200; whereas the 1989 FRA guidelines limited Ds to 100 at 4 minutes.

On reconsideration of the final rule, FRA agrees with the concerns raised by these petitioners as to the potential degradation from the guidelines of the test performance criteria for thermal and acoustic insulation, as well as for HVAC ducting. Consequently, FRA has amended the rule by restoring the function of material subcategories ''Thermal and acoustic insulation'' and ''HVAC ducting'' from the guidelines. The test performance criteria for these materials are now the same as those specified in the guidelines and are what FRA intended in the NPRM. FRA makes clear that these materials may no longer be evaluated to the criteria contained in another function of material subcategory. However, as discussed above, FRA is adding § 238.103(a)(3) to make provision for railroads that have relied on Appendix B of the May 12, 1999 final rule and already installed, ordered, or hold in inventory materials that meet the test performance criteria specified therein for acoustic and thermal insulation, as well as for HVAC Ducting. See the discussion of § 238.103(a)(3) for a fuller explanation.

As a separate matter, FRA is limiting the applicability of the flexible cellular foam test performance requirements to flexible cellular foams used in armrests and seat padding, to be more consistent with the guidelines and the NPRM. FRA is also making clear that Notes 4 and 6 apply to the revised flexible cellular foam subcategory.

Floor Covering

Note 12 relates to the use of carpet on walls and ceilings. Two petitioners observed that Note 12, formerly Note 13 of the final rule, stated only that carpeting used as a wall or ceiling covering be tested as a vehicle component, which did not convey any additional meaning since carpeting was already classified as a vehicle component. *See* 64 FR 25703. The purpose of this Note is to test in a different manner carpeting used to cover a wall or ceiling as opposed to carpeting used to cover a floor, due to differing safety concerns associated with the location of the carpet. For example, carpeting adhered to a vertical surface or a ceiling has been shown to promote flame spread in tests conducted by NIST of Amtrak car materials. FRA makes clear that carpeting applied to a wall or ceiling must be tested in accordance with the test methods and performance criteria generally applicable to wall and ceiling materials, instead of the test methods and performance criteria otherwise specified for floor covering. This is the same principle that was recommended in the 1989 FRA guidelines and proposed in the NPRM, but was inadvertently changed in the final rule text. Accordingly, carpeting used as a wall or ceiling covering shall be tested according to the ASTM E 162 and 662 test procedures utilizing the respective performance criteria of I_s less than or equal to 35 and D_s (1.5) less than or equal to 100 and D_s (4.0) less than or equal to 200, with application of Notes 1 and 2.

Note 13, formerly Note 14 of the final rule, remains unchanged, except for the reference to the newer version of ASTM E 648. FRA is incorporating such newer versions of the ASTM test standards referenced in the rule, as discussed above.

Light Diffusers, Windows and Transparent Plastic Windscreens

In the final rule, FRA established a new ''Light transmitting plastics'' function of material subcategory. Although the preamble to the final rule indicated that FRA considered light transmitting plastics to be windows, light diffusers and transparent plastic windscreens (effectively interior windows), consistent with construction industry and building code terminology, FRA did not expressly define the term in the rule text. *See* 64 FR 25650, 25702. In light of some confusion arising after publication of the final rule as to what materials were subject to the light transmitting plastics test performance criteria, FRA has amended the final rule by renaming the subcategory ''Light diffusers, windows, and transparent plastic windscreens.'' FRA makes clear that the flammability test performance criteria specified for this subcategory are applicable only to these identified items, as the criteria are less stringent than those applicable to any other vehicle component.

As stated in the Volpe Center report explaining the development of the original fire safety guidelines, the flammability ''acceptance limit recommends that all window and light diffuser glazing have an (I_s) [flame spread index] of 100 or less. This I_s is not consistent with the I_s of 35 or less required for all other sheet and panel materials but is necessary to allow for window and light diffuser glazing materials other than glass.'' (See ''Rationale for Recommended Fire Safety Practices for Rail Transit Materials Selection'' (''Volpe Center Report''), at p. 20, cited at 64 FR 25647, note 7, and placed in the public docket for this rulemaking.) At the time of the Volpe Center report, available clear plastic material could not comply with the more stringent flammability performance criteria generally specified for other materials, see Volpe Center Report at p. 21, including the prohibition on flame running and dripping. The use of plastic material in light diffusers and windows is desirable because it allows railroads to take advantage of the impact and shatter resistant qualities of plastics. In particular, windows in rail passenger cars and locomotive cabs are subject to specific impact resistance requirements

under the Safety Glazing Standards-Locomotives, Passenger Cars and Cabooses, 49 CFR part 223. The purpose of the Safety Glazing Standards is ''to provide minimum requirements for glazing materials in order to protect railroad employees and railroad passengers from injury as a result of objects striking the windows of locomotives, caboose and passenger cars.'' *See* 49 CFR 223.1; 44 FR 77352, Dec. 31, 1979. FRA has also noted the importance of glazing material toughness in helping to retain persons within the vehicles in the case of a derailment. When struck by an object, untreated glass windows could not only allow entry of the object into the passenger car or locomotive cab, posing a missile hazard to railroad passengers and employees, but the glass could shatter and thereby harm these persons. Similarly, untreated glass light diffusers would pose a hazard in a train derailment, for example, if they became dislodged from their assemblies and shattered.

In developing the final rule, FRA recognized that the 1989 FRA guidelines expressly subjected the same plastic material to differing performance criteria depending on whether the material was used as a ''windscreen,'' or as a ''window'' or ''light diffuser'' glazing material. For example, if classified as a ''windscreen,'' the guidelines limited the permissible flame spread to 35; if classified as a glazing material, the guidelines permitted flame spread as high as 100. (See ''Recommendations for revising the fire safety performance requirements in Federal Railroad Administration Notice of Proposed Rulemaking (NPRM) for Passenger Equipment,'' at p. 7, cited at 64 FR 25647, and placed in the public docket for this rulemaking.) However, FRA understood that railroads logically interpreted the guidelines to apply the same performance criteria to transparent plastics used in windscreens as to those in light diffusers and windows, as transparent windscreens are effectively interior windows. FRA removed the subcategory ''windscreen'' in preparing the final rule as part of FRA's effort to streamline the guideline and NPRM tables and eliminate differences in categorizing products that had led to the same product being acceptable if classified under one (sub)category but not acceptable if classified under another. Although opaque windscreens continue to be subject to the same performance criteria as recommended in the guidelines and proposed in the NPRM, FRA has clarified Appendix B to expressly accord transparent plastic windscreens the same treatment as windows and light diffusers.

As a related matter, Bay State's petition for reconsideration repeated a concern it had raised in commenting on the NPRM that the allowable performance criteria for window glazing and lighting lenses are too lenient, citing the location of these objects, their ease of ignition, and the Btu content of polycarbonate material. *See* 64 FR 25555. The petitioner as well as LTK raised particular concern that Note 14, formerly Note 15 of the final rule, excludes an exterior glazed window pane from any specific test performance criteria. These petitioners stated that this is especially problematic for vehicles that operate in tunnels or on elevated structures because an underfloor fire could produce flames which rise up the sides of a vehicle and ignite exterior window panels. Bay State recommended that for rail cars operating in tunnels inner window panes should be of a non-combustible material such as glass and outer window panes should be required to meet the specified performance criteria, believing that this would address FRA's impact resistance concerns for windows and promote fire safety at the same time.

FRA notes that, because of their thickness, rail car windows are not as easily ignitable when exposed to a heat source as a thinner material and believes that, during the time necessary for a window to fully combust, able-bodied vehicle occupants would be able to evacuate the vehicle if a means of escape were readily available. Of course, not all occupants may be able-bodied, especially after a collision or a derailment, nor may there be a means of immediate escape. Although FRA did not intend to make the performance criteria more stringent for window glazing than those recommended in the 1989 FRA guidelines, FRA does intend to examine the appropriateness of these criteria in Phase II of the rulemaking, taking into consideration the availability of materials that can comply with more stringent performance criteria and also possess favorable impact and shatter-resistant characteristics.

Elastomers

FRA has amended the rule by removing ''Elastomers'' as a function of material subcategory and restoring it as a category consistent with the 1989 guidelines and the NPRM. Likewise, FRA has restored the function of material subcategory for elastomers that identifies window gaskets, door nosings, diaphragms, and roof mats as items required to be tested. In addition, FRA has expressly identified seat springs as subject to the performance testing requirements as well, as stated in the preamble to the final rule. *See* 64 FR 25650.

FRA notes that LTK and Bay State recommended in their petitions for reconsideration that FRA provide guidance as to the application of the requirements of the final rule to elastomeric materials used in coupling mechanisms and truck suspensions (chevron springs, air bags, snubbers, etc.). LTK stated that these components do not meet the 1989 FRA guideline criteria, yet they represent a significant amount of combustible material under a vehicle's floor. However, as touched on above, FRA is amending the rule to limit application of the required test performance criteria only to certain elastomeric materials, as part of FRA's general response to the concern of passenger railroads that FRA significantly expanded the class of materials subject to specific flammability and smoke emission testing requirements. As a result, the rule does not subject all elastomeric material to specific test criteria, such as elastomeric material in coupling mechanisms and truck suspensions. For those railroads that have sought in good faith to comply with the final rule and generally subject all elastomeric material to flammability and smoke emission performance criteria, the products of such efforts should be considered favorably in the fire safety analyses required by § 238.103 to help demonstrate the safety of their vehicles. FRA will examine in Phase II of the rulemaking the concerns of the petitioners to specify standards for elastomeric materials used in coupling mechanisms, truck suspensions, and other elastomeric components not now addressed in Appendix B.

As stated in the preamble to the final rule, the flammability test method for elastomers was revised to reference ASTM C 1166-not ASTM C 542 as proposed in the NPRM. *See* 64 FR 25650. However, FRA incorrectly stated that ASTM C 1166 ''superseded'' ASTM C 542. *Id.* ASTM C 542, ''Standard Specification for Lock-Strip Gaskets,'' references ASTM C 1166, ''Standard Test Method for Flame Propagation of Dense and Cellular Elastomeric Gaskets and Accessories,'' as containing the flame propagation test procedure for lock-strip gaskets. Consequently, in the final rule FRA cited ASTM C 1166 as the direct source of the flame test procedure, removing the intermediate reference to ASTM C 542. Nevertheless, by removing the reference to ASTM C 542, FRA unintentionally removed the reference to the flame test performance

criteria specified in that standard. ASTM C 1166 does not contain flame propagation performance criteria itself, and the final rule did not specify flame propagation performance criteria other than ''Pass.'' As a result, FRA is amending the rule to specify what constitutes a passing test. For both dense and cellular elastomeric material, average flame propagation shall not exceed 4 inches (100 mm). This performance criterion is specified in ASTM C 542 and is thereby identical to that which was proposed in the NPRM. FRA has also corrected the rule by adding Note 1 to the ''Elastomers'' category, consistent with the 1989 FRA guidelines and the NPRM. Note 1 was unintentionally omitted from the final rule, as noted by FRA in a November 5, 1999 letter to Amtrak and APTA, cited above.

In their petitions for reconsideration, Bay State and LTK also recommended that Note 2 be applied to the requirements for elastomers. However, unlike the omission of Note 1, Note 2 was neither expressly proposed to apply to elastomeric material in the NPRM nor expressly applied to elastomers in the 1989 FRA guidelines when its text was formerly contained in Note 5. *See, e.g.,* 62 FR 49823–4. In developing the original fire safety guidelines, the Volpe Center wrote: ''Elastomers that meet the ASTM C–542 flammability standard have not, at present, been formulated to have low smoke emission properties. Therefore, no acceptance limit for smoke emission has been specified.'' *See* ''Volpe Center Report,'' at p. 24, noted above. Consequently, no smoke emission acceptance criteria for elastomers were specified in FRA's 1984 fire safety guidelines, *see* 49 FR 44584, and when FRA did recommend smoke emission acceptance criteria for elastomers in the 1989 FRA guidelines, FRA did not expressly reference the cautionary text in then-Note 5.

FRA recognizes that the ASTM E 662 test procedure for evaluating smoke emission provides that three tests are to be conducted under flaming exposure and three tests under non-flaming exposure (for a total of six tests). See paragraph 10.1 of the test procedure. Note 2 states that the specified smoke emission performance criteria apply to the exposure that produces the most smoke. However, FRA is not requiring that smoke emission performance for elastomers be limited to the exposure which generates the most smoke, in light of the seemingly uncertain historical basis for such a requirement. FRA understands the petitioners' concerns that the elastomer industry is able to supply elastomers that comply with Note 2, and in Phase II of the rulemaking FRA will consider the recommendation to apply Note 2 to elastomers.

FRA has eliminated as unnecessary former Note 16 of the final rule. As specified in the first sentence of former Note 16, only elastomeric parts with surface areas equal to or more than 16 square inches in end use configuration were required to be tested using ASTM C 1166; elastomeric parts with smaller surfaces areas were not required to be tested using this procedure. *See* 64 FR 25703. However, as FRA is making clear above, Note 10 provides that certain vehicle components less than 16 square inches in end use configuration may be exempt from performance testing, and Note 11 specifies alternative testing requirements for small parts less than 16 square inches in end use. The first sentence of former Note 16 has therefore been eliminated as redundant. The second sentence of former Note 16 has likewise been eliminated as redundant because the items formerly listed there are now expressly identified in the function of material subcategory for ''Elastomers.''

Wire and Cable

In the final rule, FRA addressed the subject of wire and cable by adding a new category in the table which required smoke and flammability emission screening for wire and cable insulation. The preamble to the final rule cited the category's importance due to the greater quantities of wire and cable used in electrically-powered intercity and commuter rail passenger cars, and was subdivided between requirements for ''Low voltage wire and cable'' and ''Power cable.'' The division of wire and cable into low voltage and power usages is common and reflects the fact that low voltage wire and cable (for communication or control uses, *e.g.*) carry insufficient energy to ignite the wire or cable under a general fault condition. Thus, low voltage wires and cables constitute a fuel when exposed to an external ignition source but not otherwise an ignition hazard in themselves. Because of their low energy, low voltage wires and cables generally operate near ambient temperatures (as elevated temperatures affect their performance). In contrast, power cables generally carry sufficient energy to ignite under fault or overload conditions and usually operate at higher temperatures up to the rating of the insulating materials used. As a result, most electrical installations require that low voltage cables be physically separated from power cables or that all cables be insulated for the highest voltages present. The fire performance test methods specified in the final rule by the Institute of Electrical and Electronics Engineers, Inc. (IEEE), Insulated Cable Engineers Association (ICEA), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL) have been specified in NFPA 130 since 1983.

Smoke Emission

Concern has been raised as to the unavailability of wire and cable complying with the smoke emission performance requirements in the final rule. In a letter to FRA, the Northeast Illinois Regional Commuter Railroad Corporation (Metra) stated that it has been unable to find cables meeting the smoke emission performance criteria specified in the final rule for all control and communications applications in 300 new passenger cars it is purchasing. (A copy of this letter has been placed in the public docket for this rulemaking.) Metra specifically identified four types of cables that are used to transfer electric power or for electrical communication between the cars: 480 Volt power cable; door signal cable; communications cable; and 27 pin jumper cable. Metra explained that, although it has been informed that the cables meet the flammability test performance criteria of ANSI/IEEE Std. 383, the cables exceed the ASTM E 662 smoke emission performance criteria specified in the final rule for non-flaming exposure. According to Metra, the cables were observed to have Ds levels between 160 and 180; whereas the final rule limited non-flaming Ds levels to 75. *See* 64 FR 25702. Metra added that the cable manufacturer is working to develop cables meeting the final rule's smoke emission performance requirements, but noted that cables developed for fire safety compliance may be ill-suited electrically and mechanically for application in trains.

Upon reconsideration of the final rule, FRA recognizes that the test performance criteria for smoke emission may not codify a settled industry standard in the way FRA had believed. FRA does note that in 1991 APTA published ''Performance Specifications for Electric Wire and Cable Used in Underground Transit Systems'' (''Performance Specifications'') to limit wire and cable smoke, flammability, and toxicity characteristics under fire conditions. These specifications had been developed in cooperation with the International Union of Public Transport (UTIP) and contain similar tests and performance criteria, including the ASTM E 662 smoke emission test, to

those in the final rule. (A copy of the Performance Specifications, which is in two parts, has been placed in the public docket for this rulemaking.) Yet, the APTA/UTIP Performance Specifications may allow higher smoke emission levels than those specified in the final rule. (See Performance Specifications, Part 1-Requirements, Table 6.2, p. 23.) FRA also recognizes that smoke emission performance requirements for wire and cable were not expressly proposed in the NPRM, and FRA did not have the benefit of expressly inviting public comment on the appropriateness of the standards.

Consequently, FRA has decided to amend the rule to remove specific smoke emission performance requirements for wire and cable from Appendix B. FRA believes it more appropriate to establish specific requirements in Phase II of the rulemaking with the advice of the Passenger Equipment Safety Standards Working Group. Moreover, as part of the fire safety research effort previously described that is being conducted by NIST, wire and cable fire performance specifications and standards will be reviewed to provide further guidance and information to FRA for consideration during Phase II of the rulemaking. In the interim, FRA will allow each railroad to determine appropriate smoke emission performance criteria for wire and cable as part of its fire safety analyses of its passenger equipment pursuant to § 238.103. In this regard, Metra stated that it had conducted a system-wide fire safety analysis and that its car manufacturer had conducted a fire safety analysis for the new cars being procured. In both of these analyses, Metra explained that the trainline cabling was found to be acceptable for use.

FRA notes that it is important for overall safety design to recognize, as the above APTA/UTIP specifications do in particular, that wire and cable must not be solely evaluated with respect to their characteristics under fire conditions. Wire and cable should also be evaluated with respect to their intended applications including standard electrical, mechanical, environmental, and installation requirements. See Performance Specifications, Part 1—Requirements, at p. 6. Moreover, requirements for electrical system safety are specified in §§ 238.225 and 238.425 of the final rule. The passenger cars Metra is purchasing are subject to the Tier I passenger equipment electrical system safety requirements in § 238.225, which addresses the safety of conductors, the main battery system, power dissipation resistors, and electromagnetic interference and compatibility.

Further, although the 1989 FRA guidelines did not include specific tests and performance criteria for wire and cable flammability and smoke emission, the guidelines did cite two series of research reports sponsored by the FTA related to wire and cable combustibility which contain information pertinent to the selection and specification of electrical insulation. These reports have been placed in the public docket for this rulemaking, and were cited in the FTA's 1984 fire safety guidelines, *see* 49 FR 32482; Aug. 14, 1984. Extensive test programs were conducted; however, these studies did not develop or recommend specific fire safety performance criteria for wire or cable insulation. The authors did note that the size and construction of the wire and cable themselves have a significant impact on flame spread and smoke emission characteristics and therefore provided relative rankings on wire and cable fire safety.

FRA notes that the potential contribution of wire and cable to smoke emission was raised by Albemarle Corporation and Equistar Chemicals, L.P., in letters to FRA following publication of the final rule. (Copies of both letters have been placed in the public docket for this rulemaking.) Both companies stated that the amount of wire and cable in rail cars is increasing and that it is important to ensure that wires and cables meet some smoke emission limit, recommending use of the ASTM E 662 smoke emission test procedure. Yet, citing the National Electrical Code, they suggested that cables that are already listed as ''limited smoke'' (by UL 1685) or ''low smoke'' (by NFPA 262) be permitted for use without additional individual testing. FRA makes clear that a railroad may use, as appropriate, wire and cable complying with UL 1685 or NFPA 262, as recommended above, for purposes of evaluating smoke emission. In light of the need to limit smoke emission from wire and cable, FRA intends to establish specific smoke emission performance limits for wire and cable in Phase II of the rulemaking.

Flammability

Particular concern has been raised as to the flammability test performance standards for low voltage wire and cable specified in the final rule. In its letter to FRA, Metra stated that joint standard NEMA WC 3/ICEA S–19 was rescinded in 1996 and that neither NEMA nor ICEA offer an alternative. Metra contended that this standard is unavailable for use in the wire and cable industry and has been of no benefit in complying with the fire safety performance criteria. Further, Metra stated that standard UL 44 does not apply to its application as it deals with CPE rubber cabling exclusively, and that standard UL 83 does not apply to wires smaller than 14AWG through 200KC MIL wire. Metra explained that these concerns have made it impossible for it to define the proper test method for small size wires and cables such as digital computer cables and antenna cables.

As touched on above, the flammability requirements concerning wire and cable in the final rule are virtually identical to those specified in NFPA 130. (*See* Section 4–2.5, Electrical Insulation, 1995 Edition; section 5–2.5, 1997 Edition). The scope of NFPA 130 has been expanded to include passenger rail cars as well as rail transit vehicles, and a revised NFPA 130 was published in 2000 with the same wire and cable fire performance requirements as when NFPA 130 was first published in 1983 for fixed guideway transit systems. (*See* Section 5–2.5 of the 2000 Edition, a copy of which has been placed in the public docket for this rulemaking.) In promulgating the final rule, FRA believed that it was codifying a settled industry standard by incorporating these NFPA wire and cable fire performance requirements. However, information available to FRA indicates that joint standard NEMA WC 3/ICEA S–19, as referenced by the NFPA, has been withdrawn.

FRA understands that NEMA and the ICEA have replaced NEMA WC 3/ICEA S–19 with other standards, the most similar of which for consideration here is NEMA WC 70/ICEA S–95–658, ''Standard for Nonshielded Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.'' (A copy of this standard has been placed in the public docket for this rulemaking.) This NEMA/ICEA standard applies to materials, constructions, and testing of 2000 Volt and below nonshielded thermoplastic, crosslinked polyethylene, and crosslinked rubber insulated wires and cables which are used for the transmission and distribution of electrical energy. Paragraph 6.8 of the standard concerns flame tests and specifies two vertical flame tests. Of these tests, vertical flame test type B as specified in paragraph 6.8.3 is virtually identical to the flame test specified in paragraph 6.19.6 of NEMA WC 3/ICEA S–19, as referenced in the final rule.

Nevertheless, FRA recognizes that the final rule's flammability performance

requirements for wire and cable were not expressly proposed in the NPRM. As a result, even though FRA incorporated flammability performance standards specified in NFPA 130, FRA did not have the benefit of expressly inviting public comment on whether such standards were appropriate as Federal requirements. Although information available to FRA indicates that most of the concern as to the appropriateness of these flammability standards relates to low voltage wire and cable, and not to power cable, FRA has decided to amend the rule to remove specific flammability performance requirements for wire and cable from Appendix B, as well. FRA intends to establish specific fire safety performance requirements for wire and cable in Phase II of the rulemaking with the advice of the Passenger Equipment Safety Standards Working Group. In the interim, FRA will allow each railroad to determine appropriate flammability performance criteria for wire and cable as part of its fire safety analyses of its passenger cars and locomotives pursuant to § 238.103. For purposes of conducting these analyses, FRA advises railroads to use the test methods specified in NEMA WC 70/ICEA S–95–658, paragraph 6.8.3; UL 44 and 83; and ANSI/IEEE Std. 383, section 2.5, as appropriate in evaluating the flammability performance of the wire and cable they use in their passenger cars and locomotives. Of course, as mentioned above, it is important for overall safety design to recognize that wire and cable must not be solely evaluated with respect to their characteristics under fire conditions. Railroads should also be mindful that requirements for passenger equipment electrical system safety continue to apply as specified in §§ 238.225 and 238.425 of the final rule.

Additional Issues for Phase II

For purposes of advancing discussion of wire and cable flammability performance standards in Phase II of the rulemaking, FRA notes that GBH, in its petition for reconsideration of the low voltage wire and cable requirements, stated that NEMA WC 3/ICEA S–19, paragraph 6.19.6, is limited to a fire test on a single wire, while there are many requirements in the UL 44 and UL 83 test procedures. The petitioner sought clarification whether the final rule subjected low voltage wire and cable to all of the requirements of the UL 44 and UL 83 test procedures, or only to the fire tests. FRA intended that only the fire performance tests apply.

Further, the petitioner stated that the NEMA/ICEA test procedure is much less severe than the ANSI/IEEE test procedure specified for power cables in the final rule. The petitioner explained that, although the latter test is sometimes unsuitable for very thin wires, such thin wires are desirable because they weigh less and occupy less space. The petitioner stated that the National Electrical Code accepts the principle of allowing cables to meet more severe fire tests in lieu of less severe specified tests, and that NFPA 130 also permits such substitutions. The petitioner therefore recommended that FRA allow a cable meeting the requirements for a more severe test such as the ANSI/IEEE standard to substitute for a cable meeting a small-scale vertical test such as that specified in the NEMA/ICEA standard. The petitioner believed that this would ensure that fire safety is not dependent on cable thickness alone but rather on actual fire performance. FRA notes that the flammability test for power cables in the final rule was intended to address the greater hazard posed by the higher voltages running through the cables rather than the source of fuel that the cables possess. The test is necessarily more severe. As a result, FRA intended that a low voltage wire or cable meeting the flammability test performance standards specified in the final rule for a power cable would comply with the wire and cable flammability test performance standards.

Moreover, with regard to the final rule's requirements for power cables, GBH stated that although ANSI/IEEE Std. 383 is correct in principle, as it is a medium to large scale test assessing flame spread, it has three disadvantages: (1) It is an older version of the same test better addressed in ASTM D 5424 (for flame spread and smoke release) and ASTM D 5537 (for flame spread and heat release), or by UL 1685, and ANSI/IEEE Std. 383 can be conducted using an ''oily rag'' as the ignition source (instead of a well-characterized gas burner); (2) it measures only flame spread (instead of heat and smoke release); and (3) it cannot fully differentiate between those cables possessing good fire performance and those possessing only mediocre fire performance in that it measures only flame spread. The petitioner believed that the ASTM pair of tests can be conducted together in a single burn and better differentiate product performance by assessing smoke and heat release rates. Thus, the petitioner recommended replacing the ANSI/IEEE Std. 383 and ASTM E 662 tests with the ASTM D 5424 and 5537 test procedures and specified pass/fail criteria. This recommendation will be considered in specifying appropriate standards in Phase II of the rulemaking.

Additionally, GBH stated that in Note 18 of the final rule, section 2.5 of ANSI/IEEE Std. 383 describes neither a circuit integrity test nor the means for testing circuit integrity. GBH mentioned that transit authority specifications have not included circuit integrity requirements with the flame test and that cables used in rail transit applications often do not meet the circuit integrity requirements. The petitioner recommended that the rule include a test that requires one conductor of the cable to continue transmitting electricity during the first 5 minutes of the test, as verified by a flashlight bulb remaining lit for the entire period, or otherwise specify a fully developed circuit integrity test. FRA notes that maintaining circuit integrity during fire exposure is only important for cables that have or affect a safety function, such as braking control and emergency lighting or communication. However, a test that demonstrates that circuit continuity is maintained (*e.g.,* as verified by a lit flashlight bulb) may not be appropriate to test circuit integrity for a cable used to transmit data, which, when exposed to fire, would need to continue carrying a data stream without dropping enough bits of data to corrupt the communication. Since the circuit integrity test requirements in the final rule applied only to power cables—and not to lower voltage wire and cable used to transmit data—FRA believes that the flashlight bulb performance standard recommended by the petitioner would have been appropriate. However, FRA did not intend to impose a more specific circuit integrity test method, as the requirement was virtually identical to the power cable circuit integrity test standard contained in NFPA 130, which also does not specify a test method. In considering wire and cable flammability performance requirements in Phase II of the rulemaking, FRA will examine whether a specific circuit integrity test requirement should be applied to low voltage wire and cable, in addition to power cable.

As a final issue, Bay State maintained that the final rule did not apply flammability standards to wire and cable designed to carry electrical current between 64 Volts and high voltage power cable, noting that rail cars contain wire and cable that carry power with voltages between 120 and 440. The petitioner's reference to both 64 Volts and 120 Volts is not clear, however, since both are seemingly suggested as the voltage cut-off for classifying a wire or cable as low voltage. As explained above, the wire and cable fire

performance standards in the final rule closely followed the wire and cable fire performance standards specified in NFPA 130. NFPA 130 itself identifies low voltage wire and cable as carrying voltages less than 100V ac and 150V dc (see Section 5–2.5 Electrical Insulation, 1997 and 2000 Editions) and references the National Electrical Code (NFPA 70). FRA did not intend to vary from the electrical classification of wire and cable specified by the NFPA. To the extent any wire or cable was in fact not subject to specific fire performance standards in Appendix B, it is because such wire or cable is not subject to specific fire performance standards by NFPA 130. Appropriate classifications for wire and cable will be considered further in Phase II of the rulemaking.

Structural Components

In the final rule, FRA established the new category ''Structural Components'' to address the structural integrity of floor assemblies and other structural elements. *See* 64 FR 25650. This category and Notes 19, 20, and 21 of the final rule originated from the structural flooring function of material subcategory in the 1989 FRA guidelines, as well as Note 6 of the guidelines. Note 19 of the final rule specified that ''[p]enetrations (ducts, etc.) shall be designed to prevent fire and smoke from entering a vehicle, and representative penetrations shall be included as part of test assemblies.'' *See* 64 FR 25703. In seeking reconsideration of the final rule, Bay State and LTK requested that FRA specify what constitutes ''prevent[s] * * * smoke from entering a vehicle'' within the meaning of this Note. In particular, Bay State raised concern that if it means anything less than no smoke then FRA must specify a test method and standard for acceptance for purposes of clarity.

FRA notes that the wording of Note 19 of the final rule is similar to that recommended in the 1989 FRA guidelines and proposed in the NPRM, which state that penetrations ''be designed against acting as passageways for fire and smoke.'' NFPA 130 also uses similar wording, substituting the term ''conduits'' for ''passageways.'' FRA has revised this Note, now Note 15, using the original wording recommended in the guidelines and proposed in the NPRM. FRA is not imposing here a more detailed test method or standard for acceptance, however, believing it best to explore such matters in Phase II of the rulemaking. Nevertheless, this requirement is necessarily connected to a railroad's fire safety analysis of a vehicle, such as required by § 238.103(c), in which safety determinations are influenced by the particular circumstances of the railroad's operating environment. In any event, the fact that fire or smoke, or both, may ultimately pass through a penetration into the passenger compartment in an actual incident would not, in itself, indicate noncompliance with this requirement. Bay State added in its petition that the rule should prohibit smoke penetration into the passenger compartment through passages in all walls and floors that separate passengers from major sources of ignition, combustion, or fuel. FRA makes clear that Notes 15 and 17 (formerly Note 21 of the final rule, discussed below) require that penetrations in portions of the vehicle body such as roofs and walls be designed against acting as passageways for fire and smoke.

Further, in their petitions for reconsideration addressing Note 20 of the final rule (now Note 16) Bay State and LTK stated that the nominal fire endurance test period specified for structural flooring assemblies should be 30 minutes instead of 15 minutes, especially for vehicles operating in tunnels or on elevated structures, to protect passengers from under-car fires. In particular, LTK stated that a 30-minute fire endurance period for flooring is typical and achievable by car builders without hardship, even noting that a one-hour floor fire endurance period is not uncommon. LTK believed that under a worst-case scenario 30 minutes can easily be expended in stopping a rail car, shutting down power so that emergency personnel can safely approach the car once they arrive, and evacuating passengers safely from the car. Bay State questioned the manner in which the ASTM E 119 floor structure test is conducted, noting in particular that cinder blocks used during testing could act as heat sinks and lead to false temperature readings. The petitioner also stated that ''passing'' temperatures for the test are too high to afford any meaningful thermal protection for passengers.

FRA makes clear that the 15-minute nominal test period specified for floor fire endurance is not a safety minimum under all circumstances. Each railroad must determine an appropriate fire endurance test period based on its operating environment—and that period may be greater than 15 minutes. Note 16 requires that the floor endurance test period be at least twice the maximum expected time to stop the train from its maximum operating speed, plus the time to safely evacuate all passengers from the vehicle under normal conditions. Note 16 also specifies that this floor endurance test period must be consistent with the safe evacuation of a full load of passengers from the vehicle under worst-case conditions. FRA notes that guidance for determining an appropriate floor endurance test period is included in a study by the Volpe Center of Bay Area Rapid Transit District (BART) ''C'' rail transit car fire safety characteristics. (*See* in particular Appendix B of ''Review of Bart ''C'' Car Fire Safety Characteristics,'' UMTA–MA–06–0178–87–1, DOT–TSC–UMTA–87–5, September 1987. FRA has placed a copy of this report in the public docket for this rulemaking.) The necessary endurance time could vary depending on factors such as the time needed to evaluate the situation and make a decision to evacuate, the time needed to announce the evacuation, rail car capacity and number of door exits, and whether the train is located at a station platform or in a tunnel. The nominal 15-minute test period specified in Note 16 is the same as that in Note 6 of the 1989 FRA guidelines and proposed in the NPRM, and FRA did not intend to change it in Phase I of the rulemaking. However, in Phase II FRA intends to examine in particular what floor fire endurance test periods are being specified by car builders and railroads, for purposes of deciding whether to modify the nominal test period.

In administering the final rule, an issue arose as to whether former Note 20, now Note 16, applied to more than the floor structure that separates a vehicle's interior from its undercarriage. Specifically, FRA was asked whether this Note applied to the floor structure separating the passenger compartment in the second level of a bi-level passenger car from the passenger compartment in the first level below. FRA did not intend that this Note apply to such an intermediate floor structure; rather, FRA intended that the fire safety of such a floor structure be addressed in former Note 21 of the final rule, now Note 17. FRA has amended the rule accordingly to make this clear. In accordance with Note 17, railroads must consider the fire safety characteristics of the floor structure separating the levels of a bi-level passenger car, for example, to address the risk that a fire may spread from one level of the car to another as well as address the hazard posed by the availability of materials to fuel a fire. Note 17 also addresses the fire endurance of other rail car elements that separate major ignition sources, energy sources, or sources of fuel-load from vehicle interiors. Examples of these elements include extensive HVAC or

power-conditioning equipment installed on roofs, or electrical equipment lockers which may become involved in fires resulting from mechanical failures or electrical insulation breakdown.

Finally, in its petition for reconsideration, LTK raised the concern that former Note 21 of the final rule, now Note 17, indicated that ''Other'' portions of a vehicle were required to be tested using the ASTM E 119 test method, while the Note alluded to a fire hazard analysis with no minimum test period. Bay State added that standard practice is to use the ASTM E 119 test method on other structural components with the proviso that walls and roofs be tested in their mode of use. Bay State also stated that this Note should address the penetration of smoke into passenger compartments, maintaining that for vehicles operating in tunnels and on elevated structures no smoke penetration should be observed during testing.

FRA makes clear that the rule does not require the ASTM E 119 test method to be applied to ''Other'' structural components of a vehicle in testing the fire endurance of such components, and FRA has amended the rule accordingly. Nor does the rule specify a minimum test performance period for purposes of demonstrating fire endurance. The appropriate test method and performance criteria vary depending on the fire hazard posed and shall be determined by the railroad through a fire hazard analysis in accordance with Note 17. The penetration of smoke into passenger compartments is addressed in both this Note and Note 15, discussed earlier.

Regulatory Impact

Executive Order 12866 and DOT Regulatory Policies and Procedures

This action has been evaluated in accordance with Executive Order 12866 and DOT policies and procedures. Although the final rule met the criteria for being considered a significant rule under these policies and procedures, the amendments contained in this action are not considered significant in the same way because they generally clarify requirements currently contained in the final rule or allow for greater flexibility in complying with the rule. These amendments and clarifications will, overall, reduce the cost of complying with the rule. However, this cost reduction has not specifically been calculated. FRA believes that these amendments and clarifications will have a minimal net effect on FRA's original analysis of the costs and benefits associated with the final rule.

Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 *et seq.*) requires a review of rules to assess their impact on small entities. FRA certifies that this action does not have a significant impact on a substantial number of small entities. Because the amendments contained in this document generally clarify requirements currently contained in the final rule or allow for greater flexibility in complying with the rule, FRA has concluded that there are no substantial economic impacts on small units of government, businesses, or other organizations resulting from this action.

Paperwork Reduction Act

This action does not change the information collection requirements contained in the original final rule.

Environmental Impact

FRA has evaluated this action in accordance with its ''Procedures for Considering Environmental Impacts'' (64 FR 28545; May 26, 1999) as required by the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), other environmental statutes, Executive Orders, and related regulatory requirements. FRA has determined that this action is not a major FRA action requiring the preparation of an environmental impact statement or environmental assessment because it is categorically excluded from detailed environmental review pursuant to section 4(c) of FRA's Procedures.

Federalism Implications

Executive Order 13132 provides in part that, to the extent practicable, no agency shall promulgate any regulation that has federalism implications, that imposes substantial direct compliance costs on State and local governments, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or the agency consults with State and local officials early in the process of developing the proposed regulation. *See* 64 FR 43255; Aug. 10, 1999. FRA believes that this regulatory action will not have federalism implications that impose substantial direct compliance costs on State and local governments, and that this action is in compliance with Executive Order 13132. The amendments contained in this document generally clarify requirements currently contained in the final rule or allow for greater flexibility in complying with the rule.

FRA does note that States involved in the State Participation Program, pursuant to 49 CFR part 212, may incur minimal costs associated with the training of their inspectors involved in the enforcement of the rule. Nonetheless, representatives of States were consulted in the development of the rule, in particular through the participation of the American Association of State Highway and Transportation Officials in the Passenger Equipment Safety Standards Working Group. *See* 64 FR 25541. FRA also considered and addressed comments on the rulemaking from the New York Department of Transportation, North Carolina Department of Transportation, Washington State Department of Transportation, and the State of Vermont Agency of Transportation.

In any event, Federal preemption of a State or local law occurs automatically as a result of the statutory provision contained at 49 U.S.C. 20106 when FRA issues a regulation covering the same subject matter as a State or local law unless the State or local law is designed to reduce an essentially local safety hazard, is not incompatible with Federal law, and does not place an unreasonable burden on interstate commerce. *See* 49 CFR 238.13. It should be noted that the potential for preemption also exists under various other statutory and constitutional provisions, including the Locomotive Inspection Act (now codified at 49 U.S.C. 20701–20703) and the Commerce Clause of the United States Constitution.

Energy Impact

Executive Order 13211 requires Federal agencies to prepare a Statement of Energy Effects for any ''significant energy action.'' 66 FR 28355; May 22, 2001. Under the Executive Order a ''significant energy action'' is defined as any action by an agency that promulgates or is expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of proposed rulemaking, and notices of proposed rulemaking: (1)(i) That is a significant regulatory action under Executive Order 12866 or any successor order, and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. FRA has evaluated this response to petitions for reconsideration of the final rule in accordance with Executive Order 13211, and has determined that this regulatory action is not a ''significant energy action'' within the meaning of the Executive Order.

Compliance With the Unfunded Mandates Reform Act of 1995

Pursuant to the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) each Federal agency ''shall, unless otherwise prohibited by law, assess the effects of Federal Regulatory actions on State, local, and tribal governments, and the private sector (other than to the extent that such regulations incorporate requirements specifically set forth in law).'' Sec. 201. Section 202 of the Act further requires that ''before promulgating any general notice of proposed rulemaking that is likely to result in promulgation of any rule that includes any Federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100,000,000 or more (adjusted annually for inflation) in any 1 year, and before promulgating any final rule for which a general notice of proposed rulemaking was published, the agency shall prepare a written statement * * *'' detailing the effect on State, local and tribal governments and the private sector. This action will not result in the expenditure, in the aggregate, of $100,000,000 or more in any one year, and thus preparation of a statement was not required.

List of Subjects in 49 CFR Part 238

Fire prevention, Incorporation by reference, Passenger equipment, Penalties, Railroad Safety, Reporting and recordkeeping requirements.

The Rule

In consideration of the foregoing, chapter II, subtitle B of title 49, Code of Federal Regulations is amended as follows:

PART 238—[AMENDED]

1. The authority citation for part 238 is revised to read as follows:

Authority: 49 U.S.C. 20103, 20107, 20133, 20141, 20302–20303, 20306, 20701–20702, 21301–21302, 21304; 28 U.S.C. 2461, note; and 49 CFR 1.49.

Subpart B—Safety Planning and General Requirements

2. Section 238.103 is amended by adding paragraph (a)(3), revising the heading and introductory text of paragraph (c), revising paragraphs (c)(1), (2), (7), (8), and (9), revising the heading of paragraph (d), and revising paragraphs (d)(1), (2)(i), (3)(i), (4) and (5) to read as follows:

§ 238.103 Fire safety.

(a) * * *

(3) For purposes of complying with the requirements of this paragraph, a railroad may rely on the results of tests of material conducted in accordance with the standards and performance criteria for flammabilitiy and smoke emission characteristics as specified in Appendix B to this part in effect on July 12, 1999 (*see* 49 CFR parts 200–399, revised as of October 1, 1999), if prior to June 25, 2002 the material is—

(i) Installed in a passenger car or locomotive;

(ii) Held in inventory by the railroad; or

(iii) Ordered by the railroad.

(c) *Fire safety analysis for procuring new passenger cars and locomotives.* In procuring new passenger cars and locomotives, each railroad shall ensure that fire safety considerations and features in the design of this equipment reduce the risk of personal injury caused by fire to an acceptable level in its operating environment using a formal safety methodology such as MIL–STD–882. To this end, each railroad shall complete a written fire safety analysis for the passenger equipment being procured. In conducting the analysis, the railroad shall—

(1) Identify, analyze, and prioritize the fire hazards inherent in the design of the equipment.

(2) Take effective steps to design the equipment and select materials which help provide sufficient fire resistance to reasonably ensure adequate time to detect a fire and safely evacuate the passengers and crewmembers, if a fire cannot be prevented. Factors to consider include potential ignition sources; the type, quantity, and location of the materials; and availability of rapid and safe egress to the exterior of the equipment under conditions secure from fire, smoke, and other hazards.

* * * * *

(7) On a case-by-case basis, analyze the benefit provided by including a fixed, automatic fire-suppression system in any unoccupied train compartment that contains equipment or material that poses a fire hazard, and determine the proper type and size of the automatic fire-suppression system for each such location. A fixed, automatic fire-suppression system shall be installed in any unoccupied compartment when the analysis determines that such equipment is practical and necessary to ensure sufficient time for the safe evacuation of passengers and crewmembers from the train.

(8) Explain how safety issues are resolved in the design of the equipment and selection of materials to reduce the risk of each fire hazard.

(9) Describe the analysis and testing necessary to demonstrate that the fire protection approach taken in the design of the equipment and selection of materials meets the fire protection requirements of this part.

(d) *Fire safety analysis for existing passenger cars and locomotives.* (1) Not later than January 10, 2001, each passenger railroad shall complete a preliminary fire safety analysis for each category of existing passenger cars and locomotives and rail service.

(2) Not later than July 10, 2001 each such railroad shall—

(i) Complete a final fire safety analysis for any category of existing passenger cars and locomotives and rail service evaluated during the preliminary fire safety analysis as likely presenting an unacceptable risk of personal injury. In conducting the analysis, the railroad shall consider the extent to which materials comply with the test performance criteria for flammability and smoke emission characteristics as specified in Appendix B to this part or alternative standards approved by FRA under this part.

* * * * *

(3) Not later than July 10, 2003, each such railroad shall—

(i) Complete a final fire safety analysis for all categories of existing passenger cars and locomotives and rail service. In completing this analysis, the railroad shall, as far as practicable, determine the extent to which remaining materials comply with the test performance criteria for flammability and smoke emission characteristics as specified in Appendix B to this part or alternative standards approved by FRA under this part.

* * * * *

(4) Where possible prior to transferring existing passenger cars and locomotives to a new category of rail service, but in no case more than 90 days following such a transfer, the passenger railroad shall complete a new fire safety analysis taking into consideration the change in railroad operations and shall effect prompt action to reduce any identified risk to an acceptable level.

(5) As used in this paragraph, a ''category of existing passenger cars and locomotives and rail service'' shall be determined by the railroad based on relevant fire safety risks, including available ignition sources, presence or absence of heat/smoke detection systems, known variations from the required material test performance criteria or alternative standards approved by FRA, and availability of rapid and safe egress to the exterior of

the vehicle under conditions secure from fire, smoke, and other hazards.

* * * * *

3. Appendix B to part 238 is revised to read as follows:

Appendix B to Part 238—Test Methods and Performance Criteria for the Flammability and Smoke Emission Characteristics of Materials Used in Passenger Cars and Locomotive Cabs

This appendix contains the test methods and performance criteria for the flammability and smoke emission characteristics of materials used in passenger cars and locomotive cabs, in accordance with the requirements of § 238.103.

(a) *Incorporation by reference.*

Certain documents are incorporated by reference into this appendix with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may inspect a copy of each document during normal business hours at the Federal Railroad Administration, Docket Clerk, 1120 Vermont Ave., N.W., Suite 7000 or at the Office of the Federal Register, 800 North Capitol Street, N.W., Suite 700, Washington, D.C. The documents incorporated by reference into this appendix and the sources from which you may obtain these documents are listed below:

(1) American Society for Testing and Materials (ASTM), 100 Barr Harbor Dr., West Conshohocken, PA 19428–2959.

(i) ASTM C 1166–00, Standard Test Method for Flame Propagation of Dense and Cellular Elastomeric Gaskets and Accessories.

(ii) ASTM D 2724–87, Standard Test Methods for Bonded, Fused, and Laminated Apparel Fabrics.

(iii) ASTM D 3574–95, Standard Test Methods for Flexible Cellular Materials-Slab, Bonded, and Molded Urethane Foams.

(iv) ASTM D 3675–98, Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source.

(v) ASTM E 119–00a, Standard Test Methods for Fire Tests of Building Construction and Materials.

(vi) ASTM E 162–98, Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.

(vii) ASTM E 648–00, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

(viii) ASTM E 662–01, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

(ix) ASTM E 1354–99, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter.

(x) ASTM E 1537–99, Standard Test Method for Fire Testing of Upholstered Furniture.

(xi) ASTM E 1590–01, Standard Test Method for Fire Testing of Mattresses.

(2) General Services Administration, Federal Supply Service, Specification Section, 470 E. L'Enfant Plaza, S.W., Suite 8100, Washington, D.C., 20407. FED–STD–191A–Textile Test Method 5830, Leaching Resistance of Cloth; Standard Method (July 20, 1978).

(3) State of California, Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation, 3485 Orange Grove Avenue, North Highlands, CA 95660–5595.

(i) California Technical Bulletin (Cal TB) 129, Flammability Test Procedure for Mattresses for Use in Public Buildings (October, 1992).

(ii) Cal TB 133, Flammability Test Procedure for Seating Furniture for Use in Public Occupancies (January, 1991).

(b) *Definitions.* As used in this appendix—

Average heat release rate ($\dot{q}''_{180}$) means, as defined in ASTM E 1354–99, the average heat release rate per unit area in the time period beginning at the time of ignition and ending 180 seconds later.

Critical radiant flux (C.R.F.) means, as defined in ASTM E 648–00, a measure of the behavior of horizontally-mounted floor covering systems exposed to a flaming ignition source in a graded radiant heat energy environment in a test chamber.

Flame spread index (I_s) means, as defined in ASTM E 162–98, a factor derived from the rate of progress of the flame front (F_s) and the rate of heat liberation by the material under test (Q), such that $I_s = F_s \times Q$.

Flaming dripping means periodic dripping of flaming material from the site of material burning or material installation.

Flaming running means continuous flaming material leaving the site of material burning or material installation.

Heat release rate means, as defined in ASTM E 1354–99, the heat evolved from a specimen per unit of time.

Specific extinction area (σ_f) means, as defined in ASTM E 1354–99, specific extinction area for smoke.

Specific optical density (D_s) means, as defined in ASTM E 662–01, the optical density measured over unit path length within a chamber of unit volume, produced from a specimen of unit surface area, that is irradiated by a heat flux of 2.5 watts/cm^2 for a specified period of time.

Surface flammability means the rate at which flames will travel along surfaces.

(c) *Required test methods and performance criteria.* The materials used in locomotive cabs and passenger cars shall be tested according to the methods and meet the performance criteria set forth in the following table and notes:

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Test Procedures and Performance Criteria for the Flammability and Smoke Emission Characteristics of Materials Used in Passenger Cars and Locomotive Cabs

CATEGORY	FUNCTION OF MATERIAL	TEST METHOD	PERFORMANCE CRITERIA
Cushions, Mattresses	All [1, 2, 3, 4, 5, 6, 7, 8]	ASTM D 3675-98	$I_s \leq 25$
		ASTM E 662-01	$D_s(1.5) \leq 100$ $D_s(4.0) \leq 175$
Fabrics	Seat upholstery, mattress ticking and covers, curtains, draperies, wall coverings, and window shades [1, 2, 3, 6, 7, 8]	14 CFR 25, Appendix F, Part I, (vertical test)	Flame time $\leq$ 10 seconds Burn length $\leq$ 6 inches
		ASTM E 662-01	$D_s(4.0) \leq 200$
Other Vehicle Components [9, 10, 11, 12]	Seat and mattress frames, wall and ceiling panels, seat and toilet shrouds, tray and other tables, partitions, shelves, opaque windscreens, end caps, roof housings, and component boxes and covers [1, 2]	ASTM E 162-98	$I_s \leq 35$
		ASTM E 662-01	$D_s(1.5) \leq 100$ $D_s(4.0) \leq 200$
	Flexible cellular foams used in armrests and seat padding [1, 2, 4, 6]	ASTM D 3675-98	$I_s \leq 25$
		ASTM E 662-01	$D_s(1.5) \leq 100$ $D_s(4.0) \leq 175$
	Thermal and acoustic insulation [1, 2]	ASTM E 162-98	$I_s \leq 25$
		ASTM E 662-01	$D_s(4.0) \leq 100$
	HVAC ducting [1, 2]	ASTM E 162-98	$I_s \leq 35$
		ASTM E 662-01	$D_s(4.0) \leq 100$
	Floor covering [12,13]	ASTM E 648-00	C.R.F. $\geq$ 5 kW/m^2
		ASTM E 662-01	$D_s(1.5) \leq 100$ $D_s(4.0) \leq 200$
	Light diffusers, windows and transparent plastic windscreens [2, 14]	ASTM E 162-98	$I_s \leq 100$
		ASTM E 662-01	$D_s(1.5) \leq 100$ $D_s(4.0) \leq 200$
Elastomers [1, 10, 11]	Window gaskets, door nosings, inter-car diaphragms, roof mats, and seat springs	ASTM C 1166-00	Average flame propagation $\leq$ 4 inches
		ASTM E 662-01	$D_s(1.5) \leq 100$ $D_s(4.0) \leq 200$
Structural Components [15]	Flooring [16], Other [17]	ASTM E 119-00a	Pass

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[1] Materials tested for surface flammability shall not exhibit any flaming running or dripping.

[2] The ASTM E 662–01 maximum test limits for smoke emission (specific optical density) shall be measured in either the flaming or non-flaming mode, utilizing the mode which generates the most smoke.

[3] Testing of a complete seat assembly (including cushions, fabric layers, upholstery) according to ASTM E 1537–99 using the pass/fail criteria of Cal TB 133, and testing of a complete mattress assembly (including foam and ticking) according to ASTM E 1590–01 using the pass/fail criteria of Cal TB 129 shall be permitted in lieu of the test methods prescribed herein, provided the assembly component units remain unchanged or new (replacement) assembly components possess equivalent fire performance properties to the original components tested. A fire hazard analysis must also be conducted that considers the operating environment within which the seat or mattress assembly will be used in relation to the risk of vandalism, puncture, cutting, or other acts which may expose the individual components of the assemblies to an ignition source. Notes 5, 6, 7, and 8 apply.

[4] Testing is performed without upholstery.

[5] The surface flammability and smoke emission characteristics shall be demonstrated to be permanent after dynamic testing according to ASTM D 3574–95, Test I_2 (Dynamic Fatigue Test by the Roller Shear at Constant Force) or Test I_3 (Dynamic Fatigue Test by Constant Force Pounding) both using Procedure B, except that the test samples shall be a minimum of 6 inches (154 mm) by 18 inches (457 mm) by the thickness of the material in its end use configuration, or multiples thereof. If Test I_3 is used, the size of the indentor described in paragraph 96.2 shall be modified to accommodate the specified test specimen.

[6] The surface flammability and smoke emission characteristics shall be demonstrated to be permanent by washing, if appropriate, according to FED-STD–191A Textile Test Method 5830.

[7] The surface flammability and smoke emission characteristics shall be demonstrated to be permanent by dry-cleaning, if appropriate, according to ASTM D 2724–87.

[8] Materials that cannot be washed or dry-cleaned shall be so labeled and shall meet the applicable performance criteria after being cleaned as recommended by the manufacturer.

[9] Signage is not required to meet any flammability or smoke emission performance criteria specified in this Appendix.

[10] Materials used to fabricate miscellaneous, discontinuous small parts (such as knobs, rollers, fasteners, clips, grommets, and small electrical parts) that will not contribute materially to fire growth in end use configuration are exempt from flammability and smoke emission performance requirements, provided that the surface area of any individual small part is less than 16 square inches (100 cm^2) in end use configuration and an appropriate fire hazard analysis is conducted which addresses the location and quantity of the materials used, and the vulnerability of the materials to ignition and contribution to flame spread.

[11] If the surface area of any individual small part is less than 16 square inches (100 cm^2) in end use configuration, materials used to fabricate such a part may be tested in accordance with ASTM E 1354–99 as an alternative to both (a) the ASTM E 162–98 flammability test procedure, or the appropriate flammability test procedure otherwise specified in the table, and (b) the ASTM E 662–01 smoke generation test procedure. Testing shall be at 50 kW/m^2 applied heat flux with a retainer frame. Materials tested in accordance with ASTM E 1354–99 shall meet the following performance criteria: average heat release rate ($\dot{q}''_{180}$) less than or equal to 100 kW/m^2, and average specific extinction area (σ_f) less than or equal to 500 m^2/kg over the same 180-second period.

[12] Carpeting used as a wall or ceiling covering shall be tested according to ASTM E 162–98 and ASTM E 662–01 and meet the respective criteria of I_s less than or equal to 35 and D_s (1.5) less than or equal to 100 and D_s (4.0) less than or equal to 200. Notes 1 and 2 apply.

[13] Floor covering shall be tested with padding in accordance with ASTM E 648–00, if the padding is used in the actual installation.

[14] For double window glazing, only the interior glazing is required to meet the requirements specified herein. (The exterior glazing is not required to meet these requirements.)

[15] Penetrations (ducts, etc.) shall be designed against acting as passageways for fire and smoke and representative penetrations shall be included as part of test assemblies.

[16] A structural flooring assembly separating the interior of a vehicle from its undercarriage shall meet the performance criteria during a nominal test period as determined by the railroad. The nominal test period must be twice the maximum expected time period under normal circumstances for a vehicle to stop completely and safely from its maximum operating speed, plus the time necessary to evacuate all the vehicle's occupants to a safe area. The nominal test period must not be less than 15 minutes. Only one specimen need be tested. A proportional reduction may be made in the dimensions of the specimen provided it serves to truly test the ability of the structural flooring assembly to perform as a barrier against under-vehicle fires. The fire resistance period required shall be consistent with the safe evacuation of a full load of passengers from the vehicle under worst-case conditions.

[17] Portions of the vehicle body which separate major ignition sources, energy sources, or sources of fuel-load from vehicle interiors, shall have sufficient fire endurance as determined by a fire hazard analysis acceptable to the railroad which addresses the location and quantity of the materials used, as well as vulnerability of the materials to ignition, flame spread, and smoke generation. These portions include equipment carrying portions of a vehicle's roof and the interior structure separating the levels of a bi-level car, but do not include a flooring assembly subject to Note 16. A railroad is not required to use the ASTM E 119–00a test method.

Issued in Washington, DC on June 17, 2002.

Allan Rutter,

Federal Railroad Administrator.

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