



**DEPARTMENT OF TRANSPORTATION**

**Federal Railroad Administration**

**49 CFR Part 238**

**[Docket No. FRA-2011-0063, Notice No. 2]**

**RIN 2130-AC34**

**Passenger Train Exterior Side Door Safety**

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

**ACTION:** Final rule.

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**SUMMARY:** This final rule will improve the integrity of passenger train exterior side door safety systems and promote passenger train safety overall through new safety standards for the safe operation and use of passenger train exterior side doors. This final rule will limit the number and severity of injuries involving passenger train exterior side doors and enhance the level of safety for passengers and train crewmembers.

**DATES:** This final rule is effective February 5, 2016. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of February 5, 2016. Petitions for reconsideration must be received on or before February 5, 2016. Comments in response to petitions for reconsideration must be received on or before March 21, 2016.

**ADDRESSES:** Petitions for reconsideration and comments on petitions for reconsideration: Petitions for reconsideration or comments on petitions for

reconsideration related to Docket No. FRA-2011-0063, Notice No. 2, may be submitted by any of the following methods:

- Web site: The Federal eRulemaking Portal, [www.regulations.gov](http://www.regulations.gov). Follow the Web site's online instructions for submitting comments, to include petitions for reconsideration.
- Fax: 202-493-2251.
- Mail: Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Room W12-140, Washington, DC 20590.
- Hand Delivery: Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Room W12-140 on the Ground level of the West Building, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Instructions: All submissions must include the agency name and docket number or Regulatory Identification Number (RIN) for this rulemaking (2130-AC34). Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided. Please see the Privacy Act heading in the **SUPPLEMENTARY INFORMATION** section of this document for Privacy Act information for any submitted comments, petitions, or materials.

Docket: For access to the docket to read background documents, any petition for reconsideration submitted, or comments received, go to <http://www.regulations.gov> at any time or visit the Docket Management Facility, U.S. Department of Transportation,

1200 New Jersey Avenue, SE., Room W12-140 on the Ground level of the West Building, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Pete Lapré, Railroad Safety Specialist, Passenger Rail Division, U.S. Department of Transportation, Federal Railroad Administration, Office of Railroad Safety, Mail Stop 25, West Building 3<sup>rd</sup> Floor, 1200 New Jersey Avenue, SE., Washington, DC 20590 (telephone: 845-216-5794); or Brian Roberts, Trial Attorney, U.S. Department of Transportation, Federal Railroad Administration, Office of Chief Counsel, Mail Stop 10, West Building 3<sup>rd</sup> Floor, 1200 New Jersey Avenue, SE., Washington, DC 20590 (telephone: 202-493-6052).

**SUPPLEMENTARY INFORMATION:**

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**I. Executive Summary**

Having carefully considered the public comments in response to FRA’s March 26, 2014, proposed rule on passenger train exterior side door safety, see 79 FR 16978, FRA issues this final rule amending the Passenger Equipment Safety Standards, 49 CFR part 238. This final rule establishes new requirements to improve the integrity of passenger train exterior side door safety systems and promote passenger train safety overall through new safety standards for the safe operation and use of passenger train exterior side doors (also sometimes referred to in this rulemaking as “doors” and “side doors”). Through the new requirements in this final rule, FRA intends to limit the number and severity of

injuries associated with the use and operation of passenger train exterior side doors and increase the overall level of safety for passengers and train crewmembers.

This final rule is based on recommended language developed by the Railroad Safety Advisory Committee's (RSAC) General Passenger Safety Task Force (Task Force) and includes new requirements for both powered and manual exterior side doors and door safety systems on passenger trains. Operating rules for train crews relating to exterior side doors and their safety systems on passenger trains and new definitions for this part are also included in this final rule. In addition, this final rule incorporates by reference American Public Transportation Association (APTA) Standard PR-M-S-18-10, "Standard for Powered Exterior Side Door System Design for New Passenger Cars" (February 11, 2011), which contains a set of minimum standards for powered exterior side door systems and door system functioning on new rail passenger cars and locomotives used in passenger service.

Other requirements established by this final rule include, but are not limited to: equipping new passenger cars with powered exterior side doors with an obstruction detection system; connecting new passenger cars (with either manual or powered exterior side doors) to a door summary circuit to prohibit the train from developing tractive power if any of the exterior side doors are open; requiring safety briefings for train crews to identify crewmember responsibilities for the safe operation of exterior side doors; operating passenger trains with their exterior side doors and trap doors closed when in motion between stations, except in limited circumstances or with FRA prior approval; and requiring railroads to develop operating rules on how to safely operate the exterior

side doors of a passenger train with incompatible exterior side door safety systems and how to safely override a door summary circuit or a no-motion system, or both, when an exterior side door failure or malfunction occurs.

FRA analyzed the economic impacts of this final rule against a “no action” baseline that reflects what would happen in the absence of this final rule. FRA expects the requirements for the operating rules and adopted APTA standard for new equipment to prevent on average about 19 injuries and 0.20 fatalities per year in the future based on similar incidents in the past. The estimated benefits from these prevented casualties over a 20-year period total \$83.9 million undiscounted; these estimated benefits have a present value of \$43.3 million calculated using a 7-percent discount rate, and a present value of \$61.7 million calculated using a 3-percent discount rate. Given that some procedural and equipment errors may still occur in the future, the analysis assumes a 50-percent effectiveness rate in preventing these types of injuries and fatalities when estimating monetary benefits. In addition, there may be other benefits from the final rule, such as fewer passenger claims for personal property damage, maintaining passenger goodwill and trust, and by lowering future maintenance costs (by encouraging the replacement of older equipment with new passenger cars equipped with more reliable door safety systems).

FRA also quantified the incremental burden of the final rule upon commuter and intercity passenger railroads. The primary contributor to the estimated costs is the train crew’s task of verifying that the door by-pass devices on the train are sealed in the normal non-by-pass mode, an operating rule requirement. The door by-pass devices are used to

override door safety systems in certain circumstances, for example, allowing a train to develop tractive power and complete its route. The second greatest cost factor is the estimated cost to implement some of the door safety features on new passenger cars with either powered or manual doors and locomotives used in passenger service. The estimated costs over the 20-year period of analysis total \$15.2 million undiscounted, with a present value of about \$8.3 million calculated using a 7-percent discount rate, and a present value of about \$11.5 million calculated using a 3-percent discount rate. The rule incurs relatively small costs because most of the initial burdens are expected from changes to railroad operating rules. The design standards for door safety systems apply to new passenger cars and locomotives used in passenger service where they can be installed cost-effectively.

These costs and benefits result in net positive benefits over 20 years of about \$68.7 million undiscounted, with a present value of \$35.0 million calculated using a 7-percent discount rate, and present value of \$50.2 million calculated using a 3-percent discount rate.

## **II. Statutory and Regulatory Background**

### **A. Passenger Equipment Safety Standards Background**

In September 1994, the U.S. Secretary of Transportation (Secretary) convened a meeting of representatives from all sectors of the rail industry with the goal of enhancing rail safety. As one of the initiatives arising from this Rail Safety Summit, the Secretary announced that DOT would begin developing safety standards for rail passenger equipment over a five-year period. In November 1994, Congress adopted the Secretary's

schedule for implementing rail passenger equipment safety regulations and included it in the Federal Railroad Safety Authorization Act of 1994 (Act), Public Law 103-440, 108 Stat. 4619, 4623-4624 (November 2, 1994). Congress also authorized the Secretary to consult with various organizations involved in passenger train operations for purposes of prescribing and amending these regulations and issuing orders under them. Section 215 of the Act (codified at 49 U.S.C. 20133). The Secretary has delegated such responsibilities to the Administrator of FRA. See 49 CFR 1.89.

FRA formed the Passenger Equipment Safety Standards Working Group to provide FRA with advice in developing the regulations Congress mandated, and on May 12, 1999, published a final rule containing a set of comprehensive safety standards for railroad passenger equipment. See 64 FR 25540. After publication of the final rule, interested parties filed petitions seeking FRA's reconsideration of certain requirements in the rule and on June 25, 2002, FRA completed its response to the petitions for reconsideration. See 67 FR 42892. The product of that rulemaking was codified primarily at 49 CFR part 238 and secondarily at 49 CFR parts 216, 223, 229, 231, and 232.

One of the purposes of the Passenger Equipment Safety Standards is protecting the safety of passenger train occupants in an emergency, including providing for emergency egress and rescue access through exterior side doors. See 49 CFR 238.235 and 238.439. FRA has engaged in rulemaking to amend the Passenger Equipment Safety Standards, and notably, on February 1, 2008, FRA published a final rule on Passenger Train Emergency Systems addressing: emergency communication, emergency egress,

and rescue access. See 73 FR 6370. FRA has also established additional requirements for passenger train emergency systems, including doors used for emergency egress and rescue access. See Passenger Train Emergency Systems II final rule published on November 29, 2013, 78 FR 71785. However, these subsequent proceedings have not focused on the safety of doors systems in non-emergency situations.

B. The Need for New Design Standards and Operating Practices for Exterior Side Doors on Passenger Train Equipment

FRA's principal reason for issuing this final rule is to reduce the number and severity of injuries caused by exterior side doors striking or trapping passengers as they board or alight from passenger trains in non-emergency situations. FRA has observed that incidents involving exterior side doors in routine use on passenger trains have previously resulted in casualties and serious injuries.

For example, on November 21, 2006, a New Jersey Transit Rail Operations (NJT) train was departing a station in Bradley Beach, New Jersey, when the closing exterior side doors of the train caught and held a passenger attempting to exit the train. The passenger was then dragged by the train along the station platform as the train was leaving the station. The passenger died as a result of his injuries.

Through its investigation of the incident, FRA found that the train's assistant conductor was not in the proper position to monitor all the train's exterior side doors as they were closing. Specifically, the assistant conductor could not see the passenger exit through a door behind where the assistant conductor was located. The assistant conductor also did not observe the door-indicator lights on the door control panel which

indicated that the exterior side doors on the passenger car were not all closed as intended. In addition, FRA learned the train was being operated with its door by-pass switch activated, negating the passenger car's door safety system, which was designed to reopen the exterior side doors after detecting an obstruction.

As a result of this incident, NJT reviewed its operating rules and limited the use of the door by-pass feature in its passenger train operations. Contemporaneously, FRA issued Safety Advisory 2006-05, "Notice of Safety Advisory: Passenger Train Safety – Passenger Boarding or Alighting from Trains" (71 FR 69606, Dec. 1, 2006). The safety advisory recommended that passenger railroads reassess their rules and procedures to make certain that trains do not depart a station until all passengers have successfully boarded or alighted from the train. The safety advisory also noted the important role of passenger train crews in the safe operation of a train after a door by-pass switch has been activated. FRA encouraged passenger railroads to voluntarily implement the recommendations of the safety advisory.

Subsequently, there have been other instances where passengers have become trapped in the exterior side doors of trains. In one instance, on February 2, 2007, a local police officer witnessed a passenger stuck between the exterior side doors of a moving Long Island Rail Road (LIRR) train at a station in New York City, New York. As a result, the passenger's right leg was dragged on the tactile strip of the station platform, causing abrasions to the passenger's leg. The police officer stopped the train and pulled the passenger free from the exterior side doors.

Other instances were “close calls” in which passengers narrowly avoided injury. On March 4, 2011, in La Grange, Illinois, a passenger’s arm and cane got caught in the closing exterior side doors of a Northeast Illinois Regional Commuter Railroad Corporation (Metra) train while attempting to board the train. A fellow passenger inside the train was able to flip the door’s emergency switch just as the train began to move. As a result, the trapped passenger was released and avoided being dragged down the station platform. A similar incident occurred on a Metra train on December 19, 2009, when a four-year-old boy’s boot became caught in the exterior side doors when alighting from the train. The child’s mother had to pull the child’s leg free from the train doors as the train was leaving the station.

As a result of these types of incidents, Metra changed its operating rules to require a “second look” up and down each train before departing a station. This operating rule requires the conductor to close all exterior side doors on the train, except the door in which he or she is standing, to take a second look up and down the station platform to make sure all the train’s exterior side doors are closed and clear of passengers. After the second look, the conductor may then close his or her open door and signal to the train’s engineer to depart the station.

Since the issuance of the NPRM for this rulemaking in March 2014, there have been other injuries involving passengers and exterior side doors. The Massachusetts Bay Transportation Authority (MBTA) reported to FRA that in June 2014 an MBTA passenger got his luggage stuck in the closing exterior side doors of the train and was subsequently injured when the train started to move. When the train started to leave the

station platform, the passenger sustained injuries after he was dragged by the train a total of 30 to 40 feet before falling.

In addition, Peninsula Corridor Joint Powers Board (Caltrain) reported to FRA an incident that occurred in October 2014 where a passenger was injured after she put her hand in the closing exterior side door of a passenger train at the Burlingame Station in San Mateo, California. The train's passenger door safety system did not work as intended and the passenger got her hand caught in the closing door and it did not re-open. As a result, the passenger was dragged by the train approximately 10 feet.

Based on these types of incidents, and other findings and concerns, including initial findings from assessing the safety of exterior side door systems on passenger railroads in the northeast region of the United States, FRA tasked RSAC to review Safety Advisory 2006-5 and develop recommendations for new safety standards to improve passenger and crewmember safety for the operation and use of exterior side doors. The Task Force, a subgroup of the RSAC Passenger Safety Working Group (Working Group), was assigned to develop these recommendations.

The Task Force was already reviewing passenger station gap issues in April 2007 when it was assigned this task. The Task Force then assembled the Passenger Door Safety Subgroup (Door Safety Subgroup) to develop recommended regulatory language to improve the safety of exterior side door systems on passenger trains. FRA shared with RSAC its initial findings that many passenger railroads in the Northeast were not operated with fully-functional passenger train exterior side door safety systems, and FRA then conducted in-person assessments of the exterior side door safety systems on a total

of 24 passenger railroads throughout the Nation. During those assessments, FRA reviewed many different models of passenger equipment and gained important information about the risks to passengers and train crews associated with the operation and use of passenger train exterior side doors. FRA shared this information with the Door Safety Subgroup, which met a total of nine times from 2008 to 2011.

Through its meetings, the Door Safety Subgroup developed proposed regulatory language to improve the safe use and operation of exterior side doors on passenger trains. The Task Force approved the consensus language on February 25, 2011, which was then adopted by the Working Group and full Committee on March 31, 2011, and May 20, 2011, respectively.

While the Door Safety Subgroup was developing proposed regulatory language, APTA developed and approved Standard SS-M-18-10, “Standard for Powered Exterior Side Door System Design for New Passenger Cars.” Subsequent to RSAC’s approval of the consensus recommendations that form the basis of this final rule, APTA changed its numbering nomenclature for its safety standards, which resulted in the numbering of this standard changing from SS-M-18-10 to PR-M-S-18-10 without changing the substantive content of the standard. Thus, this standard is identified as PR-M-S-18-10 in this final rule. This APTA standard contains minimum standards for powered exterior side door systems and door system function on new rail passenger cars because APTA designed it to be used in specifications for the procurement of new passenger cars. The standard addresses door system design requirements at the door level, car level, and train level. Non-powered doors and other types of doors on passenger cars that are not exterior side

doors are not covered by APTA's standard. This final rule incorporates by reference this APTA standard for powered exterior side door safety systems on new passenger cars and connected door safety systems on new locomotives used in passenger service. A copy of this APTA standard is included in the docket of this rulemaking for public review.

### C. RSAC Overview

In March 1996, FRA established RSAC as a forum for collaborative rulemaking and program development. RSAC includes representatives from all of the agency's major stakeholder groups, including railroads, labor organizations, suppliers and manufacturers, and other interested parties.<sup>1</sup> To the maximum extent practicable, FRA

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<sup>1</sup> A list of RSAC member groups includes the following: American Association of Private Railroad Car Owners (AAPRCO); American Association of State Highway and Transportation Officials (AASHTO); American Chemistry Council; American Petroleum Institute; American Short Line and Regional Railroad Association (ASLRRRA); American Train Dispatchers Association (ATDA); APTA; Association of American Railroads (AAR); Association of Railway Museums; Association of State Rail Safety Managers (ASRSM); Brotherhood of Locomotive Engineers and Trainmen (BLET); Brotherhood of Maintenance of Way Employees Division (BMWED); Brotherhood of Railroad Signalmen (BRS); Chlorine Institute; Federal Transit Administration (FTA);\* Fertilizer Institute; High Speed Ground Transportation Association; Institute of Makers of Explosives; International Association of Machinists and Aerospace Workers; International Brotherhood of Electrical Workers; Labor Council for Latin American Advancement;\* League of Railway Industry Women;\* National Association of Railroad Passengers (NARP); National Association of Railway Business Women;\* National Conference of Firemen & Oilers; National Railroad Construction and Maintenance Association (NRCMA); National Railroad Passenger Corporation (Amtrak); National Transportation Safety Board (NTSB);\* Railway Supply Institute (RSI); Safe Travel America (STA); Secretaria de Comunicaciones y Transporte;\* Sheet Metal Workers International Association (SMWIA); Tourist Railway Association, Inc.; Transport Canada;\* Transport Workers Union of America (TWU); Transportation Communications International Union/BRC (TCIU/BRC); Transportation Security Administration (TSA);\* and United Transportation Union (UTU).

\*Indicates associate, non-voting membership.

utilizes RSAC to provide consensus recommendations with respect to both proposed and final agency action. When appropriate, FRA assigns a task to RSAC, and after consideration and debate, RSAC may accept or reject the task. If RSAC accepts the task, it establishes a working group with the appropriate expertise and representation of interests to develop recommendations to FRA for action on the task. These recommendations are developed by consensus. A working group may establish one or more task forces to develop facts and options on a particular aspect of a given task. The individual task force then provides that information to the working group for consideration. When a working group comes to unanimous consensus on recommendations for action, the package is presented to the full Committee for a vote. If RSAC is unable to reach consensus on a recommendation for action, the task is withdrawn and FRA determines the best course of action. If the proposal is accepted by a simple majority of RSAC, the proposal is formally recommended to the Administrator of FRA. FRA then determines what action to take on the recommendation. Because FRA staff members play an active role at the working group level discussing the issues and options and drafting the language of the consensus proposal, FRA is often favorably inclined toward the RSAC recommendation. However, FRA is not bound to follow the recommendation and the agency exercises its independent judgment on whether the recommended rule achieves the agency's regulatory goal(s), is soundly supported, and is

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consistent with policy and legal requirements. Often, FRA varies in some respects from the RSAC recommendation when developing the actual regulatory proposal or final rule.

FRA notes and explains any such variations in the rulemaking it issues

D. Passenger Safety Working Group and General Passenger Safety Task Force

In May 2003, RSAC established the Working Group to handle the task of reviewing passenger equipment safety needs and programs as well as developing recommendations for specific actions to advance the safety of rail passenger service.<sup>2</sup>

In September 2006, the Working Group established the Task Force principally to examine the following issues: (1) exterior side door securement; (2) passenger safety in train stations; and (3) system safety plans.<sup>3</sup> After being assigned its task by the Working Group, the Task Force assembled the Door Safety Subgroup to develop recommended regulatory language to improve the safety of exterior side door systems on passenger trains. The Door Safety Subgroup consisted of Task Force members who were interested

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<sup>2</sup> Members of the Working Group, in addition to FRA, include the following: AAR, including members from BNSF Railway Company (BNSF), CSX Transportation, Inc. (CSXT), and Union Pacific Railroad Company (UP); AAPRCO; AASHTO; Amtrak; APTA, including members from Bombardier, Inc., Herzog Transit Services, Inc., Interfleet Technology, Inc. (Interfleet, formerly LDK Engineering, Inc.), LIRR, Maryland Transit Administration (MTA), Metro-North Commuter Railroad Company (Metro-North), Metra, Southern California Regional Rail Authority (Metrolink), and Southeastern Pennsylvania Transportation Authority (SEPTA); ASLRRRA; BLET; BRS; FTA; NARP; NTSB; RSI; SMWIA; STA; TCIU/BRC; TSA; TWU; and UTU.

<sup>3</sup> Members of the Task Force include representatives from various organizations that are part of the larger Working Group and, in addition to FRA, include the following: AAR, including members from BNSF, CSXT, Norfolk Southern Railway Co., and UP; AASHTO; Amtrak; APTA, including members from Alaska Railroad Corporation, Caltrain, LIRR, MBTA, Metro-North, MTA, NJT, New Mexico Rail Runner Express, Port Authority Trans-Hudson, SEPTA, Metrolink, and Utah Transit Authority; ASLRRRA; ATDA; BLET; FTA; NARP; NRCMA; NTSB; Transport Canada; and UTU.

in addressing the risks associated with the operation and use of exterior side doors on passenger equipment. The Door Safety Subgroup met during scheduled Task Force meetings.<sup>4</sup>

To aid the Task Force with its delegated task, FRA's Office of Chief Counsel, in conjunction with FRA's Office of Railroad Safety, typically drafted proposed regulatory text for discussion purposes at Door Safety Subgroup meetings. Door Safety Subgroup members would then offer suggested changes to this proposed draft text. Staff from DOT's John A. Volpe National Transportation System Center also attended these meetings and contributed to the discussions. Minutes of each meeting are part of the docket in this proceeding and are available for public inspection.

Through these various discussions, the Door Safety Subgroup developed proposed regulatory language which the Task Force accepted as a recommendation to the Working Group on February 25, 2011. The Task Force's consensus language was then subsequently approved by the Working Group on March 31, 2011. The consensus language was then presented before the full Committee on May 20, 2011, where it was approved by unanimous vote. Thus, the Working Group's recommendation was adopted by the full Committee as the recommendation to FRA.

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<sup>4</sup> The Task Force met on the following dates and in the following locations to discuss passenger train exterior side door safety: April 23-24, 2008, in San Diego, CA; July 29-30, 2008, in Cambridge, MA; December 2, 2008, in Cambridge, MA; March 3, 2009, in Arlington, VA; April 21, 2009, in Washington, DC; May 27-28, 2009, in Cambridge, MA; July 7-8, 2009, in Philadelphia, PA; October 6-8, 2009, in Orlando, FL; and February 24-25, 2011, in Washington, DC.

In the March 26, 2014 NPRM, FRA proposed adding some regulatory text that was not expressly part of the RSAC's consensus recommendation. For instance, for the benefit of the regulated community, in proposed § 238.131(c), FRA identified other sections in part 238 that include substantive door safety requirements. FRA also clarified that all exterior side doors on new intercity passenger train cars—in addition to new commuter train cars—would be subject to the requirements of § 238.131.

In addition, FRA made changes to the RSAC recommended language to clarify the proposed requirements in the NPRM. For example, FRA clarified that the provisions of the NPRM applied to full-sized exterior side doors besides those used for the boarding and alighting of passengers at train stations, such as baggage doors, but did not apply to small hatches of compartment-sized doors and the exterior side doors on private cars. FRA also decided not to include in the NPRM an RSAC recommendation that powered, exterior side passenger doors be connected to a manual override device capable of opening the exterior side doors when the doors are locked out, because this design requirement was already covered under existing regulations at § 238.112(a) and (b). FRA also moved an RSAC consensus item proposed under existing § 238.305 (“Interior calendar day mechanical inspection of passenger cars”) to new proposed § 238.133(g)(2) in the NPRM, so the requirement would apply to all tiers of passenger cars, including conventional locomotives used in passenger service.

FRA specifically asked for comment on these areas of the proposal. However, FRA did not receive any comments on these or other areas of the NPRM where FRA specifically invited comment.

### **III. Discussion of Specific Comments and Conclusions**

Overall, FRA received four comments in response to the NPRM from the following parties: Sensotech Inc. (Sensotech), the Southeastern Pennsylvania Transportation Authority (SEPTA), Veolia Transportation (Veolia), and an anonymous commenter. The comment from Veolia was initially received as an e-mail to an FRA staff director asking whether one of Veolia's procedures conflicted with a proposal in the NPRM. FRA has included the e-mail and an attachment received by the staff director in the public docket for this rulemaking and is treating the e-mail and its attachment as a comment on this rulemaking.

FRA appreciates and carefully considered all comments it received regarding this rulemaking. The comments raised issues on what type of technology FRA considered when developing this rulemaking, whether FRA would modify its proposal in § 238.135(b) that exterior side doors and trap doors must be closed between stations, and whether a specific safety procedure would be an allowable exception to the proposed requirement to keep the doors closed. FRA also received one comment that was not germane and outside the scope of this rulemaking. FRA did not change any of the regulatory text in this final rule based on the comments it received but addresses each comment below. The full text of every comment FRA received on the NPRM is in the public docket for this rulemaking at [www.regulations.gov](http://www.regulations.gov). Please note that the order in which the comments are discussed in this document is not intended to reflect the significance of the comment raised or the standing of the commenter.

Sensotech submitted a comment commending FRA for its efforts to improve passenger safety and comfort. However, Sensotech stated it did not see in the NPRM any information about the use of acoustic technology to support passenger door safety. According to Sensotech, “[a]coustic technology is the most suitable technology for remote sensing for rail doors” because it is not sensitive to metallic carbon dust created by moving trains and brake pads, and the technology is programmed to distinguish between outdoor elements (like hail, snow, and rain) versus a person or other hard objects. As a result, according to Sensotech, acoustic technology is more reliable in supporting passenger door safety than other technologies. Sensotech described an acoustic technology door sensor system it developed for transit bus doors implemented in buses. In addition, Sensotech described an application it developed specifically for passenger rail door application, stating that it has been installed more recently on a commuter rail system.

FRA thanks Sensotech for providing information about the use of acoustic technology to promote door safety. However, FRA did not specify in the NPRM, and declines to specify in this final rule, what specific type of technology railroads must use to comply with the requirements of this final rule. FRA sought to develop requirements that are performance-based. FRA believes that allowing railroads the freedom to decide how best to comply with the requirements in this final rule allows railroads to make the most efficient decisions to meet FRA’s safety requirements and minimize the costs of the rule.

SEPTA submitted a comment expressing concern regarding the proposed requirement that all exterior side doors and trap doors be closed when a train is in motion between stations. (See the Technical Background, Section IV.A, for an overview of trap doors). SEPTA noted that, in a letter to FRA's Associate Administrator for Railroad Safety/Chief Safety Officer dated February 17, 2010, SEPTA committed to operating all its trains with two or fewer cars in passenger service with all their side doors closed between stations. In addition, SEPTA noted that any train with three or more cars in passenger use would be required to operate with its side doors closed between stations depending on the number of crewmembers assigned to the train. SEPTA added these requirements to its operating manual as a crew responsibility.

However, since sending this letter to FRA in 2010, SEPTA replaced its Silverliner II and Silverliner III cars with manual doors and trap doors with new Silverliner V cars. According to SEPTA, these Silverliner V cars have power-operated doors with manual trap doors located inside the cars. SEPTA specifically raised concern about the requirement proposed in § 238.135(b) that trap doors must be closed between stations. SEPTA stated that when the trap doors are open and the side doors are closed, a passenger could not fall out of the car from the passenger compartment. Therefore, according to SEPTA, the cars can move safely between stations with the cars' side doors closed and its trap doors open. However, SEPTA noted that the proposed language in § 238.135(b) does not make an allowance for this car design. SEPTA also stated that as part of its capital program it estimates that in 2020 it will begin to replace its current Silverliner IV fleet with new Silverliner VI cars, which it anticipates will be fully

compliant with the requirements of 49 CFR 238.135. In the meantime, SEPTA suggested FRA allow an exception “[w]hen the open trap [door] is located within the car allowing the side door to completely close over the opening preventing any access to the outside of the car from the passenger compartment.”

In its comment to FRA, Veolia also expressed concern about the requirement that exterior side doors and trap doors be closed when a train is in motion between stations in proposed § 238.135(b). Veolia described a “redundant safety procedure” at a particular interlocking where it requires conductors to verify the signal indication. Veolia believed this procedure may necessitate opening a door while the train is moving and sought to continue this practice. In addition, Veolia noted that some conductors open their workstation door as their train approaches the limits of its authority, red signals, or other areas of particular concern. Veolia sought clarification on whether these practices would violate the requirements proposed in § 238.135(b).

After carefully considering the SEPTA and Veolia comments, FRA has decided not to change the language proposed in § 238.135(b). However, as discussed further below, FRA is providing additional time for railroads to comply with the requirement that exterior side doors and trap doors remain closed when a train is in motion between stations. The exceptions to this requirement apply when a train is departing or arriving at a station and a crewmember needs to observe the station platform and the open door is attended by a crewmember, and when a crewmember must perform on-ground functions, such as, but not limited to, lining switches, making up or splitting trains, providing crossing protection, or inspecting the train.

While the scenarios described by SEPTA and Veolia in their separate comments do not fall under either of these defined exceptions, § 238.135(c) allows a railroad to apply for special approval from FRA's Associate Administrator for Railroad Safety/Chief Safety Officer to operate passenger trains with exterior side doors or trap doors, or both, open between stations. Any request for relief must include a written justification, a detailed hazard analysis, and be signed by the railroad's chief executive officer or equivalent. FRA believes this approval process is the appropriate way to handle issues involving railroads that may need relief from the requirement in § 238.135(b), rather than establish additional, generally-applicable exceptions that are better addressed on a case-by-case basis. By requiring passenger railroads to conduct a safety analysis and apply to FRA for approval for a special exception, FRA will be able to make individualized determinations that tailor any such exception to the specific circumstances involved and the safety of the affected passengers and train crews.

FRA received an additional anonymous comment regarding hours of service issues involving the trucking industry and a Federal Motor Carrier Safety Administration proposal. Since the comment is not germane to passenger door safety issues or this rulemaking, and its scope is not within FRA's jurisdiction, FRA did not address this comment in this final rule.

With the exception of the issues the commenters raised and FRA discussed above, FRA did not receive any comments on the proposed rule. Therefore, unless specifically noted, FRA has adopted the requirements proposed in the NPRM in this final rule.

#### **IV. Technical Background**

A. Overview

Passenger railroads have responded to growth in ridership by expanding rail service, investing in new rail equipment, and incorporating new technologies into their passenger equipment. This has resulted in the varied arrangements of powered exterior side doors in passenger trains today. Many types of these power door systems have safety features to alert train crewmembers of an obstruction in a door.

These power door systems are complex. They employ components and electrical circuits to open and close the exterior side doors, contain door status indicators, and provide a means to determine motion and the end of the train. Power door systems operate electrically from commands given by train crews through signals from door switches, sensors, relays, and other devices that interface with and monitor the exterior side doors individually and throughout the entire trainline circuit. These various appurtenances typically act to provide a warning when exterior side doors are closing, respond to obstructions to closing doors, and prevent the doors from opening when a train is in motion. When connected to the propulsion system, these devices will inhibit the development of tractive power if an exterior side door is prevented from closing. Lock-out and by-pass systems are also employed to allow trains to operate even when equipment related to the exterior side doors is malfunctioning.

However, not all passenger cars are equipped with powered exterior side door systems. In fact, for those passenger railroads with cars equipped with manually operated exterior side doors or trap doors, some have allowed the doors to remain open between train stations to increase operating efficiency. Trap doors are metal plates that, when

raised, reveal a fixed or moveable stairwell to facilitate low-level boarding. To provide high-level platform boarding, the train crew closes (or keeps closed) the trap to cover the stairwell. Trap doors are not exterior side doors, but are manually operated by the train crew to enable boarding and alighting through the exterior side doors.

**B. Scope of FRA Safety Assessment of Passenger Railroads**

FRA reviewed accident data involving passenger train exterior side doors immediately following the incident in Bradley Beach, New Jersey, discussed in Section II.B., above. From its review, FRA determined that while accidents were infrequent they could have severe consequences. FRA identified numerous factors, conditions, and components that could adversely impact the safe operation or the integrity of the door safety system of a passenger train. These include door position, controls, and status indicators, no-motion and end-of-train circuits, power failure, traction-inhibit, throttle movement, mixed consist operation, malfunctioning equipment, door operating rules, and employee knowledge of the door safety system(s) on the train he or she is operating.

As noted above, FRA decided to perform a safety assessment of 24 railroads operating passenger trains utilizing many different models of equipment in the United States. These assessments were performed to identify the risks endangering passenger and crew safety, specifically when passengers were riding upon, boarding, or alighting from trains. FRA employed analytical techniques to identify any limitations of the safety features engineered into the trains' exterior side doors and of the railroads' rules governing their employees who operate them. Each of the passenger railroads was assessed individually, and exterior side door safety concerns were found with virtually all

the railroads surveyed. However, the door safety concerns varied among the railroads in nature and degree.

There are various types of trains that are designed for particular purposes. The type and sequence of locomotives and cars assembled or coupled together to form a train is referred to as the train consist. A train consist can typically be changed frequently at the railroad's discretion. As part of its assessment, FRA reviewed the predominant types of passenger train service utilized in the United States to determine the risks posed to passengers and train crews by exterior side door safety systems.

One type of service involves passenger trains with conventional locomotives in the lead pulling consists of passenger coaches and sometimes other types of cars such as baggage cars, dining cars, and sleeping cars. Such trains are common on long-distance, intercity rail routes operated by Amtrak.

Most passenger rail service in the Nation is provided by commuter railroads, which typically operate one or both of the two most common types of service: push-pull service and multiple-unit (MU) locomotive service. Push-pull service is passenger train service typically operated in one direction of travel with a conventional locomotive in the rear of the train pushing the consist (the "push mode") and with a cab car in the lead position of the train. The train can then transition into the opposite direction of travel, where the service is operated with the conventional locomotive in the lead position of the train pulling the consist (the "pull mode") with the cab car in the rear of the train. A cab car is both a passenger car and a locomotive. The car has both seats for passengers and a control cab from which the engineer can operate the train. Control cables (or electric

couplers) run the length of the train to facilitate commands between the control cab, passenger cars, and the conventional locomotive. These control cables make up an electric circuit called the trainline circuit. Electrical cables also run the length of the train to provide power for heat, light, and other purposes.

Self-propelled electric or diesel MU locomotives may operate individually in passenger train service, but typically operate semi-permanently coupled together as a pair or triplet with a control cab at each end of the train consist. During peak commuting hours, multiple pairs or triplets of MU locomotives are combined and operated together to form a single passenger train.

In Amtrak's Northeast Corridor, high-speed Acela Express passenger train service is provided using trainsets. Acela Express trainsets are train consists of specific types of passenger cars such as first class, business class, and café cars that are semi-permanently coupled between power cars located at each end of the consist. These trainsets virtually never change as the power cars and passenger cars are semi-permanently coupled and integrated together with computer controls. The power cars provide tractive power to both ends simultaneously and have a control cab from which the engineer can operate the train, but do not carry passengers.

#### C. Uses of Passenger Car Exterior Side Doors

Passenger car exterior side doors are designed for various purposes on passenger trains. Most exterior side doors are used for passenger boarding and alighting at train stations. However, exterior side doors also have other uses. For example, exterior side doors can be used for emergency responder access and passenger egress during

emergency situations, whether or not the doors are normally used for passenger boarding or alighting. As previously stated, exterior side doors can also be used for non-passenger functions such as loading baggage or stocking dining car supplies. Exterior side doors that serve these purposes often vary greatly in size and dimension. In some instances, these exterior side doors are full-sized doors, while on other equipment the doors are essentially just small hatches or are compartment-sized.

D. Types of Passenger Car Exterior Side Doors

Through its safety assessment of exterior side door safety systems on passenger trains, FRA reviewed several generations of equipment. FRA found a wide range of doors and corresponding door safety features with varying levels of sophistication. The level of sophistication was generally limited by the technology that was available at the time that the passenger car was manufactured and the railroad's ability to purchase, or retrofit, equipment with more sophisticated door safety features.

There are three types of exterior side doors in service today: hinged, sliding, and plug. Hinged doors on a passenger car operate like a door in a home entranceway. They swing inward into the car, to open, and back towards the exterior of the car, to close. Exterior sliding doors on a passenger car are moving panels of various sizes that retract into pockets within the side walls of the passenger car when opening. Sliding doors can be designed with one panel or leaf that slides open and closed. Sliding doors can also consist of two bi-parting panels or leaves, which open by retracting from each other into the side wall and close by joining together in the center of the doorway. Plug doors on a passenger car are comprised of a sliding panel which opens and slides along the side of

the car to open the exterior side door. However, the sliding panel does not retract into a pocket like a sliding door; instead, when closed, the door conforms to the side of the passenger car to seal out environmental noise and minimize aerodynamic resistance.

E. Exterior Side Door Configurations and Operation

Passenger railroads use a variety of configurations for the exterior side doors on the passenger cars in their fleets. FRA reviewed passenger cars with exterior side doors located at multiple locations along the sides of the cars: at each end, at their quarter points, and in the middle.

Passenger car exterior side doors may be operated manually, or with either electro-mechanical or electro-pneumatic power. Manually operated exterior side doors are simple hinged or sliding doors that are manually operated by passengers or crewmembers at each station stop. Powered electro-mechanical doors are doors that employ an electric motor to drive a mechanical operator for opening and closing. Powered electro-pneumatic doors, like electro-mechanical doors, employ a mechanical operator for opening and closing. However, powered electro-pneumatic doors use compressed air to drive the mechanical operator instead of an electric motor. The mechanical operators provide opening and closing force to each door panel or leaf through mechanical linkage and a gearbox or similar device. All powered door systems require mechanical door operators.

F. Assessment Findings

FRA identified a number of key factors, conditions, and components that could impact passenger and crew safety from the use and operation of passenger train exterior side doors. These are addressed, individually, in detail below.

1. Door Position

FRA reviewed the risk posed by the open position of exterior side doors while passenger trains were in motion. FRA determined that railroads operating passenger trains with manually operated exterior side doors cannot control whether an individual door is opened or closed unless a crewmember is present at each door. When a crewmember is not present, passengers themselves can open the exterior side doors of the cars and exit or enter the train. Therefore, the potential exists for passengers to jump off or on moving trains at stations. At the same time, FRA found that other passenger trains were purposefully run with their manually operated exterior side doors in an open position even though train crewmembers sometimes were not stationed at the doors.

Passenger trains with powered exterior side doors are normally operated with the doors closed between stations. However, some passenger railroads operated trains with their doors open between stations. These passenger stations are in close proximity to each other and alternate between high- and low-level platforms for passenger boarding and alighting. The operation of passenger trains with open exterior side doors presents significant safety concerns as passengers and crewmembers could potentially fall out of an open door while the trains are moving. Due to the safety hazards arising from operating a passenger train with open exterior side doors, FRA has determined that, with

limited exceptions for crew use only, passenger trains should have their exterior side doors closed when they are moving between stations.

## 2. Door Control Panels

Powered exterior side doors on passenger cars are controlled and operated by door control panels, which are usually located on both sides of each car. These panels provide an interface between the train's door system and the train crew, and typically require activation with a door key. The door key is inserted into the control panel and is then used to turn the panel on or off. Once the panel is turned on, a conductor can issue commands to open or close exterior side doors by pressing buttons on the panel. Some passenger trains have door control panels that allow only local control of the exterior side doors. This means the conductor can operate the exterior side doors only in the same car as the door control panel. Other passenger trains allow their door control panels to operate all exterior side doors on the side of the train where the panel is activated. This allows the door control panel in any passenger car to open simultaneously all the exterior side doors on one side of the train. The conductor also can open or close only those doors forward of the activated panel, those doors rearward of the activated panel, or simply the single door directly adjacent to the activated panel.

FRA found many instances in which door control panels were left energized after the door control panel key was removed. This can occur when the keyhole for the door control panel key is worn or not maintained and the conductor removes the key without actually turning off the door control panel. With the door control panel energized, passengers can press the door-open button on the panel and open one or more exterior

side doors on the train even when the train is still moving. This situation can occur on many different types of equipment.

3. Failure Modes, Effects, and Criticality Analysis (FMECA)

As part of its assessment, FRA evaluated how the door systems on various passenger trains responded to a loss of door control power by de-energizing the door control circuit breaker. FRA found significantly different responses on various railroads when door control systems experienced a circuit failure causing a loss of power. Some exterior side doors closed, some did not close at all, and others simply stopped where they were if they were moving at the time of the failure. Additionally, in a number of instances, the train could still produce tractive power even though the door control circuit failure allowed the exterior side doors to remain open.

Employees who operate the exterior side doors of a passenger train should understand how a safety system for a door they control will respond to a loss of power. Employees can then take steps to safeguard against any safety hazards raised by the loss of power. This final rule requires all door systems on new passenger cars, and connected door systems on new locomotives used in passenger service, to be subject to a formal safety analysis that includes a FMECA before being placed into service. By requiring new passenger cars and locomotives used in passenger service to be subjected to this analysis before being placed into service, railroads will help ensure that the failure of a single component of a door safety system will not create an unsafe condition for passengers and train crewmembers.

4. Power Door Status

Power door status is monitored by door position switches and can be conveyed locally or through the trainline circuit using various arrangements of lights to relay the condition of the doors to the train crew. On most passenger trains, one or more lights illuminate on the interior or exterior of a passenger car above the exterior side door that is open. The lights then extinguish when the exterior side doors are closed.

If the train's door status is configured with a door summary circuit for trainline display, one or more lights illuminate on the active door control panel when all the doors are closed on that side of the train. Therefore, if a power door did not close, the external and internal lights would remain illuminated and the trainline door status light on the door control panel would not illuminate. This door status trainline circuit is often, but not always, displayed to the engineer as a door closed light in the locomotive cab. When the light is illuminated it tells the engineer that the exterior side doors on both sides of the train are closed and the train is ready to safely leave the station.

FRA found that all trains with powered exterior side door systems had some type of door status indicators train crews could use to determine if there was an obstruction in the exterior side doors. However, in many instances on-board personnel were not using the door status indicators as intended. In some cases, crewmembers did not use these indicators because the indicators' lens color was not maintained properly and, therefore, the indicators were not reliable. In other cases, FRA found that train crews looked in the general location of an indicator light on a door control panel, but at times mistakenly read a different indicator as the door status indicator because the lens color was not uniformly maintained. Door status indicators need to be maintained properly for ready and reliable

reference by crewmembers tasked with safely operating the door systems. If properly maintained, these indicators should alert train crewmembers about a possible obstruction in an exterior side door.

5. No-Motion Circuit

No-motion is an electric circuit the door safety system uses to determine if a passenger car or train is moving or not. This circuit is designed to prevent the exterior side doors of a train from opening while the train is in motion, except for a crew access door. A crew access door can be any exterior side door on a passenger train that a crewmember opens for his or her use with a door control power key. No-motion circuitry will also cause the exterior side doors to close when the train accelerates above a pre-determined speed. If the no-motion circuit (also referred to as a “no-motion system” in this document) malfunctions, the conductor cannot open the exterior side doors using trainline commands since the circuit is designed to fail safely and the door system assumes that the train is in motion. However, if such a malfunction occurs, many passenger cars are equipped with a by-pass switch that can override the no-motion circuit and enable the exterior side doors to open.

During its assessment, FRA discovered that some railroads train crews actually used the no-motion circuit to close the exterior side doors when departing stations. In these instances, train crewmembers were not closing the exterior side doors using a door control panel, but instead were using the throttle to accelerate the train and close the exterior side doors through the no-motion circuit. The assessment also identified that passenger and train crew safety was at risk on many railroads because safety-sensitive

switches that could impact the door system, such as the no-motion by-pass switch, were not properly positioned or protected. An improperly positioned no-motion by-pass switch presents the risk of an undesired opening of an exterior side door while the train is in motion, which could go undetected by the train's crew.

Exterior side doors should be closed only after the train crew determines it is safe for the train to depart the station. To protect passenger and train crew safety, the no-motion by-pass switch should be secured or sealed. This will mitigate the potential of an accidental activation of this safety-critical device.

#### 6. End-of-Train Circuit

The end-of-train circuit is part of the door safety system. The circuit is used to identify the last passenger car in the train consist, or the physical end of the train, or both. Door control system manufacturers have utilized various ways to identify and convey the end of the train to the door safety system. The end of the train is identified on different passenger cars by using jumpers, manual or automatic switches, circuitry in electric couplers, marker lights, or other devices. Door safety circuits can become compromised when the end of the train is established somewhere other than the last car of the train. This situation can occur by the unintentional activation of the end-of-train circuit. For example, some passenger cars toggle switches, which are readily accessible to passengers, are used to establish the end of the train. If improperly positioned and activated by a passenger or train crewmember at a location that is not at the end of the train, all passenger cars rearward of the car with the activated end-of-train circuit would not be recognized by the door safety system. Because the door safety features in those

cars would not function, this would increase the risk of a passenger becoming entangled in a door and dragged when the train departs the station.

FRA's assessment identified eight railroads on which end-of-train circuit switches were not properly positioned or protected. These switches should be secured and protected to prevent access by unauthorized personnel and unintentional activation which could compromise the safety of the door control system and go undetected by the train crew.

#### 7. Door Safety Features

As touched on above, the sophistication of passenger car door safety features is just as varied as the arrangement of the exterior side doors themselves. Hinged-type manually operated exterior side doors do not utilize any specific door system safety features. Yet, FRA found that all but one model of passenger cars with manual or powered sliding-type doors employed a flexible, rubber-like strip of varying widths on the leading edge of the door. This flexible strip runs from the floor to the ceiling along the edge of the door to seal the car interior from environmental conditions. Although not necessarily intended for a door system safety purpose, this flexible strip or seal on the edge of the door is pliable and bends, which aids in pulling an obstruction free from the door. In addition, FRA found that some power door systems added a door push-back feature intended to aid in freeing an obstruction in a door. The push-back feature allows someone to push back on a closing door so that the individual can open or partially open the door and clear an obstruction. However, not all passenger cars that have a flexible strip on the edge of the door have a door push-back feature.

Power door systems on passenger cars can also be outfitted with obstruction detection systems. Obstruction detection systems use sensors to determine if something is preventing an exterior side door from closing as intended. The system will cause the exterior side door to react to an obstruction by automatically stopping the door from closing or by reversing the door movement like elevator doors. Most obstruction detection systems require the exterior side door to actually physically impact the obstruction to detect it. These types of obstruction detection systems use a pressure-sensitive edge on the leading edge of the exterior side door or door jamb, or both. If something is caught in the door, the sensitive edge becomes compressed and causes the door to react to the obstruction by stopping the closing door or by reversing the door movement. Other obstruction detection systems employ a tilting switch that detects when the door is bumped off balance by an obstruction and causes a reaction similar to doors employing a sensitive edge for obstruction detection.

There are also systems that use more sophisticated technologies to detect obstructions. These advanced systems monitor motor amperage, or air pressure in passenger cars with powered electro-pneumatic exterior side doors. These systems detect an increase in the electric current or air pressure, which tells the door safety system there is an obstruction in the exterior side doors. Other advanced obstruction detection systems do not actually require the exterior side doors to impact an obstruction to detect it. Instead, they may use photo optics or laser light beams to prevent the door from closing if something interrupts a light beam that runs along the path of the closing exterior side

door. They may also use other technologies; see the discussion of Sensotech’s comment in Section III., above.

However, FRA found during its assessment that it was possible to become entangled in a powered exterior side door on numerous different models of equipment, even when door obstruction detection systems were utilized. In these cases, the door obstruction detection systems failed to detect either small obstructions (e.g., a human hand) or large obstructions (e.g., a wheelchair).

FRA believes that while door obstruction detection systems reduce the risks to passenger safety and newer systems utilize more reliable technology, they do have limitations. Therefore, train crews need a clear understanding of the limitations of the safety features on the exterior side doors of the trains they are operating. When train crews do not thoroughly understand the limitations of their trains’ exterior side door safety features, passengers and train crews alike could face an increased risk of serious injury or death. Crews must realize the limits of the safety features of each powered door safety system for each type of passenger vehicle they operate.

#### 8. Traction Inhibit

As mentioned above, door control safety systems can be connected to a train’s propulsion system. On these systems, the status of powered exterior side doors is communicated through the trainline, and the door summary circuit is interlocked with the train’s propulsion system. Therefore, when a powered exterior side door is open, the train cannot produce tractive power and move, a function commonly referred to as “traction inhibit.” Similarly, if an exterior side door on a train is not completely closed,

and there is an obstruction in the door, the traction inhibit function prevents the train from developing tractive power and departing the station. Only after all the exterior side doors are closed as intended can the train produce tractive power and leave the station.

During its assessment, FRA found many different models of equipment in which the exterior side door safety systems were not connected to the propulsion system of the train. Consequently, these trains could produce tractive power whether or not the exterior side doors were open or closed. Thus, if a passenger became entangled in a door, the passenger could be dragged by one of these trains because they lacked a design feature to stop such a train from developing tractive power and leaving the station.

FRA also found that on many different models of passenger cars and locomotives used in passenger service with a door obstruction system and traction inhibit, it was possible for the train to produce tractive power even when an individual became entangled in an exterior side door. This unexpected condition was possible because the door obstruction system did not detect the obstruction and instead conveyed a message that all the exterior side doors were closed. Therefore, the final rule will enhance passenger and train crew safety by requiring all new passenger cars to have door safety systems which include door obstruction detection systems that release obstructions when detected.

#### 9. Malfunctioning Equipment and Door Lock-Out

Due to the complexity of powered exterior side doors and their controls, car manufacturers have designed door systems to respond to equipment malfunctions. If an exterior side door malfunctions, each door can be individually isolated from the trainline

circuit without affecting the rest of the train. Train crews refer to this as “cutting out” or “locking-out” a door. This is especially important if the door system is connected to the train’s propulsion system, as one malfunctioning exterior side door that cannot close is designed to inhibit the development of tractive power for the entire train. Therefore, many passenger cars are equipped with exterior side door lock-out switches that can disconnect power to the malfunctioning exterior side door while still allowing the trainline circuit to complete so that the train can draw tractive power and move.

During FRA’s assessment, FRA observed train crewmembers that did not know how to isolate or lock-out a malfunctioning exterior side door. FRA found that, instead, train crews would often activate the door by-pass system. Such a practice presents a significant risk to safety. Properly locking-out one malfunctioning exterior side door maintains the integrity of the train’s door safety system while still providing door obstruction and traction inhibit protection for all other exterior side doors on the train. However, overriding the door safety system through the door by-pass feature can undermine the safety features on all exterior side doors, including traction inhibit. Activating the door by-pass feature this way unnecessarily increases the possibility that a passenger or train crewmember could be caught in a door and dragged by a train.

#### 10. Malfunctioning Equipment and Door By-Pass

If a train crew cannot identify which exterior side door is malfunctioning on its train, the train crew can utilize a door by-pass device to override the door safety system to move the train. However, as noted above, activation of the door by-pass device on many types of equipment negates some or all of the exterior side door safety features.

FRA found during its assessment that many passenger cars had exterior side door safety circuits that could become compromised by the unintentional activation of a door by-pass device. On these models of passenger cars, if a by-pass switch was activated anywhere on a passenger train it would place the entire train in door by-pass mode. This would in essence by-pass the entire train's door safety system, which presents a significant risk to passenger and crew safety. Elsewhere, FRA found that the door by-pass switch would only affect the exterior side doors of the train if it was activated in the controlling locomotive. Overall, FRA found that accidental activation of the door by-pass switch often happened without the knowledge of the train crew, whether the switch was located in the controlling locomotive cab or a trailing locomotive cab. Consequently, door by-pass devices must be sealed in an off position to mitigate the potential of an accidental activation of the door by-pass device.

However, if there is an en-route exterior side door malfunction, railroads must have a procedure for communicating to all train crewmembers that there is a defect in the train's exterior side doors, the door by-pass device has been activated, and the door safety system has been overridden.

#### 11. Effects of Throttle Use on Powered Exterior Side Doors

The locomotive throttle lever is used to control the locomotive's power. It can also be used to issue commands to the powered exterior side doors. As mentioned above, some exterior side doors are manufactured so that the movement of the locomotive throttle from a position of rest to motion automatically issues a command to close all the powered exterior side doors.

However, FRA's assessment found that passenger cars responded differently to application of a train's throttle. For some powered exterior side doors, the movement of the locomotive throttle caused them to close. For other door systems, the doors would stop closing and freeze if they were in motion when the throttle was applied. Other door systems operated as intended and were not affected by the position of the throttle. In addition, concerns associated with locomotive throttle movement were further exacerbated if the passenger train was in door by-pass mode when the throttle was applied. On these trains, the throttle movement, in combination with the door by-pass feature activation, negated some or all of the exterior side door obstruction safety features.

A train's exterior side doors should be commanded to close only after the train crew determines it is safe to depart. If throttle movement can affect the functioning of a train's exterior side doors, then employee training is necessary to help ensure the train crew understands the risks involved.

## 12. Mixed Consist Operation

Railroads routinely operate passenger trains comprised of mixed consists or different models of passenger cars, which can have incompatible door systems. Mixed consists can contain passenger cars with different types of exterior side doors, such as manual doors and powered doors, or different types of powered exterior side doors that are not compatible with each other's door safety system. When exterior side door systems are incompatible, they do not properly communicate trainline commands and are not part of a single door summary circuit. These door systems are usually incompatible

due to the design of the individual passenger cars or because the door systems utilize different control systems, wiring, or operating voltages, often a result of the varying ages of the different models of passenger cars used in a mixed consist.

The operation of trains comprised of different types of passenger cars with incompatible exterior side door systems requires additional measures to help ensure passenger safety. For example, in a mixed consist train with manual and powered exterior side doors, the portion of the train with the manual doors requires train crewmembers to take extra measures to ensure the doors are closed. The operation of a mixed consist train comprised of passenger cars with different models or types of powered exterior side doors that are not compatible with each other's door safety system requires train crewmembers to take such extra measures as well. The different cars may not communicate door opening and closing commands throughout the length of the train. These door systems usually have different safety features; for example, a portion of the train could have exterior side doors equipped with a door obstruction detection system, while the remainder of the train's doors do not. The powered door system on a passenger car without a door obstruction system is limited in its ability or unable to detect, annunciate, or release an obstruction in a door. FRA also found that in these mixed consist trains the door summary circuit did not account for all the exterior side doors, due to incompatible equipment. The door status indicator would therefore be misleading as it would indicate the status for only part of the mixed consist train. As a result, FRA believes there is an inherent, increased risk of becoming entangled in an exterior side door on a mixed consist train.

Train crews may need to take extra measures to ensure the safe functioning of doors in mixed consist trains they operate. These extra measures should ensure the operation of mixed consist trains provides a level of safety at least equivalent to that of a train operating with compatible exterior side door safety systems.

### 13. Operating Rules

Passenger railroads have established sets of operating rules to provide instruction and guidance to employees on how they should act in given situations. Railroad operating rules for the functioning of passenger train exterior side door systems can vary broadly from railroad to railroad. For example, FRA found that some railroads' operating rules did not require a train's exterior side doors to be closed while the train was in motion between stations. Other railroads' rules did not define the safety limitations of each type of door safety system in the passenger cars their train crews operated and sometimes the train crews were unaware of these limitations. Some railroads had operating rules addressing use of exterior side doors and station stops, and some did require crewmembers to make platform observations for train arrivals at and departures from stations. However, often these rules did not instruct crewmembers to ensure trains did not depart from stations until all passengers had successfully boarded or alighted from the trains. Finally, FRA found that some operating rules did not address the additional steps necessary to provide continued passenger safety following activation of a safety override device, such as a door by-pass or no-motion by-pass switch.

Railroad operating rules are fundamental tools to enhance overall railroad safety. Passenger train crews need a clear understanding of the risks to safety involved in the

operation of exterior side doors. They must understand the limitations of the safety features of each exterior side door system for the equipment they operate. Such an understanding is especially critical when an exterior side door safety system fails and the crew must take action to ensure passenger safety until the system can be restored back to its designed level.

## **V. Section-by-Section Analysis**

### Subpart A—General

#### Section 238.5 Definitions

FRA is amending this section to add the following new definitions to this part: by-pass, door isolation lock, door summary circuit, end-of-train circuit, exterior side door safety system, no-motion system, and trainline door circuit. FRA intends for these definitions to clarify the meaning of significant terms used in this final rule. These definitions will minimize the potential for misinterpretation of the regulatory language. RSAC recommended that FRA add these definitions to this section, and FRA agrees with RSAC's recommendation.

“By-pass” means a device designed to override a function. This term describes devices that override various safety features on a passenger train. For example, a door by-pass is a by-pass feature that when activated overrides the door summary circuit. Among its functions, the door summary circuit indicates to the controlling cab of the train that all exterior side doors are closed as intended, or locked out with a door isolation lock, or both. In some instances, train crews must use a by-pass device when a passenger train's exterior side doors or its appurtenances fail en route so the train can reach its

destination.

“Door isolation lock” means a cutout/lockout mechanism installed at each exterior side door panel to secure a door in the closed and latched position, provide a door-closed indication to the summary circuit, and remove power from the door motor or door motor controls. FRA added this term because it is in the definition of a door summary circuit and helps clarify what potential information is being relayed to the controlling cab of a train by the door summary circuit.

“Door summary circuit” means a trainline door circuit that, among its functions, indicates to the controlling cab of the train that all exterior side doors are closed as intended, or locked out with a door isolation lock, or both. FRA added this term to clarify what this circuit does in relation to the operation of a passenger train and what information it provides the controlling cab of the train about the exterior side doors.

“End-of-train circuit” means a feature typically used to determine the physical end of the train, or the last passenger car in the train, or both, for the door summary circuit. FRA added this term to make clear what an end-of-train circuit does in a passenger train. For clarity, FRA changed the term to “end-of-train circuit” in the final rule rather than just “end-of-train,” as proposed in the NPRM. For additional discussion about end-of-train circuits, see the Technical Background, Section IV.F.6.

“Exterior side door safety system” means a system of safety features that enable the safe operation of the exterior side doors of a passenger car or train. The exterior side door safety system includes appurtenances and components that control, operate, and display the status of the exterior side doors, and is interlocked with the traction power

control. FRA added this term to explain what types of systems or subsystems of safety features make up an exterior side door safety system.

“No-motion system” means a system on a train that detects the motion of the train. This system is normally integrated with the exterior side door safety system.

“Trainline door circuit” means a circuit used to convey door signals over the length of a train. This term is used in the definition of door summary circuit.

#### Subpart B—Safety Planning and General Requirements

FRA has carefully organized the various requirements in this final rule. These requirements apply to all tiers of passenger cars and locomotives used in passenger service. In the NPRM, FRA made clear that, in addition to requirements for passenger cars, the proposed rule would apply certain requirements to locomotives used in passenger service. FRA invited comment on how the various requirements in the rule should be organized and specifically the approach the NPRM took to applying requirements to locomotives used in passenger service, including comments on any alternative approach. However, FRA did not receive any comment from the public on these or other areas of the NPRM where FRA specifically invited comment.

As discussed above in Section III, Discussion of Specific Comments and Conclusions, FRA did receive and carefully considered comments on the requirements proposed in the rulemaking. However, FRA has not changed the rule text on the basis of the comments received. FRA is nonetheless modifying the rule text in this final rule to provide the regulated community with greater clarity on the requirements of this rule. FRA describes these changes below in this Section-by-Section Analysis.

## Section 238.131 Exterior Side Door Safety Systems—New Passenger Cars and Locomotives Used in Passenger Service

FRA is adding this new section to part 238, addressed below by paragraph.

Paragraph (a) applies to powered exterior side door safety systems on new rail passenger cars, and connected door safety systems on new locomotives used in passenger service, ordered on or after April 5, 2016, or placed in service for the first time on or after February 5, 2016. This paragraph does not apply to new or existing rail passenger cars or locomotives used in passenger service with manual exterior side doors. It also does not apply to existing rail passenger cars or locomotives used in passenger service with powered exterior side doors.

Paragraph (a)(1) requires that all powered exterior side door safety systems on new rail passenger cars and connected door safety systems on new locomotives used in passenger service be built according to APTA Standard PR-M-S-18-10, “Standard for Powered Exterior Side Door System Design for New Passenger Cars” (Standard). APTA’s Rail Standards Policy and Planning Committee approved this APTA Standard on February 11, 2011. The Task Force and Working Group subsequently reviewed and recommended the Standard to the full Committee, which then recommended that FRA use the Standard in this rulemaking. FRA is incorporating by reference this Standard, which contains a set of minimum safety standards for powered exterior side door safety systems on new passenger rail cars and connected door safety systems on new locomotives that are used in passenger service.

The Standard addresses design requirements and safety features that occur at three different levels: the individual door, the car, and the train. Passenger cars and passenger locomotives must be able to communicate with each other to provide for the safe use and operation of exterior side doors in passenger cars. As a result, the Standard requires the train's door summary circuit to be interlocked with the propulsion system of the train's locomotive(s). Specifically, the train may not develop tractive power if an exterior side door in a passenger car is not closed, unless the door is under the direct physical control of a crewmember.

The implementation dates in this paragraph are consistent with other applicability dates FRA imposed, and FRA believes they are achievable. This Standard is available to all interested parties online at [www.apta.com](http://www.apta.com). Additionally, FRA made a copy of the Standard part of the docket in this proceeding and it is available for public inspection.

Paragraph (a)(2) requires powered exterior side door safety systems on all new passenger cars and connected door safety systems on new locomotives used in passenger service to be designed based on a FMECA. FRA requires such door safety systems to be subject to a FMECA to ensure door system manufacturers consider and address the failure modes of exterior side doors. As discussed in the Technical Background, Section IV.F.3, FRA learned there was great variability among different models of passenger cars on how exterior side doors reacted to a system failure. For example, when there was a loss of electricity to the door control circuit, some powered exterior side door systems responded by automatically closing the exterior side doors, while in other equipment the doors would stay open. FRA believes that subjecting these door safety systems to a

FMECA will ensure that passenger car and locomotive manufacturers consider how these systems may fail and make informed decisions on the safest design approach.

Paragraph (a)(3) requires powered exterior side doors in all new passenger cars to be equipped with an obstruction detection system, and a connected system in all new locomotives used in passenger service, to identify and release an obstruction while preventing the train from developing tractive power until the obstruction is released. An obstruction detection system detects and reacts to both small and large obstructions in the powered exterior side doors. This will make boarding and alighting from passenger trains safer.

This new paragraph is necessary based on FRA's assessment of powered exterior side doors on various passenger train operations, as discussed specifically in the Technical Background, Section IV.F.7. In many instances, FRA discovered that a passenger, or his or her belongings, could be caught in a powered exterior side door of a passenger car without the door recognizing the passenger or the obstruction. As a result of this failure, some passenger trains were able to complete the door summary circuit and receive tractive power to depart even though there was an obstruction in a powered exterior side door. These types of incidents have led to serious passenger injuries and even death. FRA also learned that some door systems were unable to identify large obstructions caught in a train's exterior side doors. For example, some passenger trains could generate tractive power even when a large object like a wheelchair or walker became stuck in the exterior side doors. Passenger door systems that cannot detect these

larger obstructions pose substantial safety hazards to passengers with disabilities or other passengers who may need extra assistance to board or alight from a train.

Paragraph (a)(4) prohibits the activation of a door by-pass feature in new passenger cars with powered exterior side doors and in connected locomotives from affecting an exterior side door's obstruction detection system. As discussed in the Technical Background, Section IV.F.10, FRA discovered that many passenger door safety systems could be compromised by the activation of a door by-pass device. Operating a train in door by-pass mode can negate some or all of the safety features of the exterior side door safety system, including the obstruction detection system and door status indicator.

FRA also discovered that some railroads had obstruction detection systems that were engineered into their passenger trains' exterior side doors, but did not use them and, instead, operated trains in door by-pass mode. By negating these important door safety features, the railroads created the potential for passengers to get caught in closing exterior side doors and dragged as the trains developed tractive power and departed from stations.

Therefore, FRA is requiring that obstruction detection systems in new passenger cars and connected locomotives used in passenger service function as designed, even if the train in which the equipment is being hauled is operated in door by-pass mode. This will ensure that passenger safety is not compromised by deactivating these safety features in the train's exterior side doors.

Paragraph (a)(5) requires the train crew to use a door control panel key or some other secure device to access the train's door control system. The train crew will need a

key or other secure device to operate the door control panel to open or close the exterior powered side doors. FRA does not intend to require passengers in an emergency to use a key to operate any manual override device for opening powered exterior side doors. See 49 CFR 238.112. Such manual override devices must be readily accessible to passengers in an emergency. Instead, this requirement is intended to reduce the risk that passengers in non-emergency situations will gain access to the door control system and open the exterior side doors to prematurely exit a train while it is still in motion.

FRA makes clear that although this final rule often states requirements in terms of the duties of railroad crewmembers, any person as defined in § 238.5, including a contractor or subcontractor to a railroad, who performs any function required by this final rule, must perform that function in accordance with this rule. See § 238.9(c) (“Responsibility for compliance”). Consequently, the requirements of this final rule apply to contractors and subcontractors performing railroad crewmember functions.

Paragraph (a)(6) is related to paragraph (a)(5). This paragraph makes clear that if the door control panel key or other similar device is removed from the door control panel, the powered exterior side doors on the train cannot be opened or closed from the door control panel. A door control panel key or other similar device is required to operate the powered exterior side doors from the door control panel.

This requirement helps ensure that only the conductor or another qualified crewmember can open or close the exterior side doors from the door control panel. This requirement will minimize the possibility that passengers will open the exterior side doors in non-emergency situations when a train is entering or departing a station.

However, FRA notes that under § 238.112, powered exterior side doors must continue to be equipped with a manual override device to allow passengers to open the doors in emergency situations.

Paragraph (a)(7) ensures that train throttle movement will have no effect on the proper functioning of exterior side door safety systems in new passenger cars and connected door safety systems in new locomotives used in passenger service. As discussed in the Technical Background, Section IV.F.11, FRA discovered through its door safety assessment that certain passenger car door systems were designed so that the exterior side doors would automatically close when the train's throttle was applied. As FRA understands, the rationale behind such a design is to provide an operational enhancement for the engineer to automatically command the exterior side doors to close when the throttle is applied. However, from FRA's observations during its door safety assessment, the exterior side doors on some railroads' trains would stop moving and remain open while other exterior side doors would close when the train's throttle was applied. This could result in doors being partially open while trains are in motion, thereby increasing the risk that passengers could fall out of trains and suffer injuries. Moreover, FRA also learned that powered exterior side doors on trains running in door by-pass mode reacted very differently when the throttle was applied. On these trains, the throttle movement, in combination with the door by-pass feature activation, negated some or all of the exterior side door obstruction safety features. Therefore, FRA is requiring that, for new passenger cars and locomotives used in passenger service, locomotive

throttle movement does not open or close a passenger train's exterior side doors or have any other effect on the proper functioning of the train's door safety system.

Paragraph (b) applies to new rail passenger cars, with either manual or powered exterior side doors, and connected door safety systems on new locomotives used in passenger service, ordered on or after April 5, 2016, or placed in service for the first time on or after February 5, 2018. This paragraph does not apply to existing rail passenger cars or locomotives used in passenger service with either manual or powered exterior side doors.

Paragraph (b)(1) requires new passenger cars with manual or powered exterior side doors, and connected door safety systems on new locomotives used in passenger service, to be designed with a door summary circuit to prohibit trains from developing tractive power if the exterior side doors are not closed. This paragraph is necessary to prevent serious injuries from occurring when trains have their exterior side doors open while moving.

However, FRA is allowing an exception for train crew use. This requirement does not apply to an exterior side door that is under the direct physical control of a crewmember for his or her exclusive use when a train generates, or is in the process of generating, tractive power. This limited exception is necessary to help train crews make platform and other observations outside of the train. For example, train crews often open one exterior side door to ensure the train is sitting properly along the station platform before opening all of the exterior side doors and allowing passengers to board and exit from the train.

Paragraph (b)(2) requires that manual and powered exterior side doors on new passenger cars be connected to interior and exterior door status indicators, and that new locomotives used in passenger service be compatible with such indicators. The exterior side doors must be connected to interior and exterior door status indicators, usually lights, to indicate when a door is not closed. These indicators provide railroad personnel both inside the train and on the station platform a fast, easy way to visually identify whether an exterior side door is not closed as intended. FRA believes that these interior and exterior door status indicators will help train crews determine whether it is safe for trains to depart stations.

Paragraph (b)(3) requires all new passenger cars with manual or powered exterior side doors and all new passenger locomotives to be connected to a door summary status indicator located in the train's operating cab and viewable from the engineer's normal operating position. When all the exterior passenger side doors on a train are closed, the door summary status indicator, usually a light, illuminates in the engineer's operating cab. As a result, the indicator provides an easy way for an engineer to know that all the exterior side doors have been closed as intended and it is safe for the train to depart. If the indicator is not illuminated, the engineer knows that the exterior side doors are not closed and that the train's brakes should be maintained so the train does not move.

Paragraph (b)(4) requires that, for all new passenger cars with manual or powered exterior side doors, and all new locomotives used in passenger service equipped with a door by-pass system, the door by-pass system will be functional only when activated from the controlling locomotive. Putting a train in door by-pass mode allows the train to

develop tractive power regardless of the status of the doors. During its door safety assessment of passenger railroads, FRA found that for many models of equipment the entire passenger train could be put into door by-pass mode by activating one of several different door by-pass switches throughout the train consist. Moreover, FRA even found that by-pass switches could be activated without the knowledge of the train crew—a dangerous situation.

Because this paragraph requires that the door by-pass switch can only be activated in the controlling locomotive of a passenger train, engineers should always know if the door safety system has been overridden through the use of the door by-pass switch. In addition, having the switch only be activated in the controlling locomotive of the train greatly minimizes the risk that a passenger may activate the device, whether inadvertently or not. Since this device affects vital safety features, FRA believes that all precautions should be taken to ensure that a train is put in door by-pass mode only after careful consideration by the train's crew.

Paragraph (c) identifies other sections in this part that include substantive requirements for exterior side door safety for ease of reference. These include requirements for using side doors in an emergency.

Section 238.133 Exterior Side Door Safety Systems—All Passenger Cars and Locomotives Used in Passenger Service

FRA is adding this new section to part 238, addressed below by paragraph.

Paragraph (a) requires that each passenger train crew verify all exterior side door by-pass devices that could affect the safe operation of the train are sealed in the non-by-

pass position when taking control of the train. For example, from its door safety assessment of various passenger railroads, FRA discovered that on some railroads the door by-pass switches in the cabs of trailing locomotives could place an entire train in door by-pass mode if activated anywhere on the train. FRA believes that all train crewmembers should understand when first taking control of a passenger train whether the exterior side doors of the train are in door by-pass mode. However, when there is face-to-face relief of another train crew, the train crew coming on duty will not need to verify the status of the door by-pass devices by visual inspection. This exception will help railroad efficiency by not requiring on-coming train crews to conduct an inspection to verify whether their train is being operated in door by-pass status if they are directly notified by the out-going crew through face-to-face relief regarding the status of the train's door by-pass devices. When there is no direct face-to-face relief by the crew going off duty, the on-coming train crew must verify the status of their train's door by-pass devices.

However, paragraph (a) also allows railroads to develop a functional test to verify that the door summary status indicator is functioning as intended, instead of a visual inspection of each door by-pass device. Allowing qualified railroad personnel to conduct a functional test instead of a visual inspection of all door by-pass switches makes the verification process more efficient. Of course, the testing plan the railroad develops to replace individual visual inspections must be adequate to determine that each door safety system is functioning as intended.

Paragraph (b) requires passenger train crewmembers to notify the railroad's designated authority under the railroad's defect reporting system if a door by-pass device that could affect the safe operation of the train is found unsealed during the train's daily operation. If the train crew can test the door safety system and determine the door summary status indicator is functioning as intended, then the train may remain in service until the next forward repair point where a qualified maintenance person (QMP), as defined in § 238.5, can apply a seal, or until its next calendar day inspection, whichever occurs first. If the crew cannot determine that the door summary status indicator is functioning as intended, then the train crew must follow the procedures in paragraph (c) of this section.

Paragraph (c) requires that, when it becomes necessary to activate a door by-pass device while a train is en route, the train may continue to its destination terminal if the train crew: conducts a safety briefing that includes a description of the location(s) where crewmembers will position themselves on the train to observe the boarding and alighting of passengers; notifies the railroad's designated authority that the train's door by-pass device has been activated; and adheres to the operating rules required by § 238.135 ("Operating practices for exterior side door safety systems"). After the train has reached its destination terminal, the train may continue in passenger service until the train's arrival at the next forward repair point or until its next calendar day inspection, whichever occurs first, if the railroad adheres to the requirements in paragraphs (c)(1) and (2) of this section before moving the equipment with an active door by-pass device.

Paragraph (c)(1) allows a passenger train with a door by-pass device activated to remain in service past its destination terminal if an on-site QMP determines it is safe to use the equipment in passenger service and repairs cannot be made at the time of inspection. If a QMP is not available, a determination to keep the equipment in service may be made based upon an on-site qualified person's (QP), as defined in § 238.5, description of the condition to a QMP offsite. This requirement will help ensure passenger safety by requiring a QMP to make the determination on whether it is safe to move the train, but will still provide the railroad with sufficient flexibility to handle an activated door by-pass device.

Paragraph (c)(2) requires that either the QP or QMP notify the crewmember in charge of the train's movement that the door by-pass device has been activated. This notification requirement ensures that the crewmember in charge of the train's movement knows the train is operating with its door by-pass device activated and that some or all of the door safety features of the train's exterior side doors may not be properly functioning. In addition, the train crew must then hold a safety briefing that includes information such as the locations where each crewmember will position himself or herself on the train to ensure that passengers board and alight from the train safely. This safety briefing helps to ensure that the train operates with the same level of safety after the door by-pass device has been activated as it did before the device was activated.

Paragraph (d) requires each passenger railroad to maintain a record of any door by-pass activation, unintended opening of a powered exterior side door, and subsequent repair(s) made to the passenger door safety system in the defect tracking system required

by § 238.19. While railroads do currently maintain records concerning the malfunction of exterior side doors and subsequent repairs, FRA is not aware that railroads maintain such records when a door by-pass device has been activated or only when there has been an unintentional door opening. Collecting this information will provide useful data concerning test and maintenance intervals that are developed under this part, e.g., § 238.107 and subpart F. Like other records collected under § 238.19, railroads must make these records available to FRA for inspection upon request.

Paragraph (e) is intended to prevent exterior side doors from being operated from a door control panel when the door key or other similar device has been removed. As evidenced by FRA's assessment of various passenger train door operations, this language is necessary because some trains' door safety systems have allowed the door control panel to remain energized after the door control panel key or similar device was removed from the panel. When door control panels can still be operated after the specific door key or similar device has been removed, passengers can open the train's exterior side doors by simply pressing the door open button. FRA is concerned because passengers have opened exterior side doors to exit trains early before the trains came to a complete stop at stations. Additionally, some passengers have opened the exterior side doors to exit trains while leaving stations because they forgot to exit while the trains were stopped at station platforms. Either of these scenarios could easily result in severe passenger injuries.

Accordingly, this requirement mandates the use of a door panel key or a similar device to energize or activate the door control panel. The door control panel key or device will be held by the train's crew. FRA does make clear that nothing in this

paragraph is meant to change any of the requirements in § 238.112 for the accessibility and operation of manual override devices for exterior side doors in an emergency situation. This paragraph does not require passengers in an emergency situation to use a key to operate any manual override device for opening powered exterior side doors required by § 238.112. Passengers and crewmembers must still be able to utilize the manual override devices for exterior side doors in an emergency situation without the use of a door key or other similar device.

Paragraph (f) requires a train to maintain the integrity of its door safety systems by proper activation of the end-of-train circuit. This includes, but is not limited to, securing the end-of-train circuit in a manner that prevents unauthorized access. The railroad must secure the end-of-train circuit to protect the integrity of the train. FRA discovered that, in many models of passenger cars, a simple switch was used to activate the end-of-train circuit and denote the end of the train. This switch was often in the vestibule area of the car and accessible to passengers. FRA also found a switch that was activated in a car other than at the end of the train. Activation of the switch eliminates from the door summary circuit all passenger car exterior side doors beyond the activated switch, allowing the potential for a passenger in one of those cars to become entangled in an exterior side door and dragged when the train departs because the door safety features do not function. This paragraph helps ensure in particular that if a railroad uses end-of-train circuit switches in its trains, the railroad takes sufficient care of the switches to prevent them from being tampered with or inadvertently activated by unauthorized users. FRA added language to this section in this final rule to clarify that railroads must ensure

the integrity of the end-of-train circuit and not just prevent unauthorized access to end-of-train circuit switches on trains that use such switches to affect the end-of-train circuit.

Paragraph (g)(1) requires all exterior side door safety system override devices that could adversely affect a train's door safety system to be inactive and sealed in all passenger cars and locomotives in the train consist. This requirement applies to cab cars and MU locomotives, as well as conventional locomotives. The requirements of this paragraph are subject to the provisions of paragraph (c) of this section for a train when it is necessary to activate a door by-pass device, to ensure the train may safely continue to its destination terminal.

Paragraph (g)(2) is similar to paragraph (g)(1). However, this paragraph emphasizes that as part of the calendar day inspection, QMPs will verify that all exterior side door safety system override devices are inactive and sealed in all passenger cars and all locomotives in a passenger train's consist, including cab cars and MU locomotives, if they are so equipped. Passenger cars or locomotives that QMPs find with unsealed or active exterior side door safety system override devices are considered defective under the regulation and subject to the movement-for-repair provisions of this part.

#### Section 238.135 Operating Practices For Exterior Side Door Safety Systems

FRA is adding this new section to part 238, addressed below by paragraph.

Paragraph (a) requires each crewmember to participate in a safety briefing that identifies each crewmember's responsibilities for the safe operation of the exterior side doors on the crewmember's train. The briefing takes place at the beginning of each crewmember's duty assignment before the train departs. This requirement helps ensure

all the crewmembers involved in the operation of a passenger train understand their roles and responsibilities for the safe operation and use of the exterior side doors.

In this final rule, FRA revised the language in this paragraph to clarify that the required safety briefing must address possible door safety issues arising anytime during the crew's operation of the assigned train, including when the train arrives at and departs from a station. The briefing requirement applies to providing direction throughout the crew's entire operation of the assigned train. For example, if construction or other work will be conducted at a station platform that could negatively impact the boarding and alighting of passengers or crewmembers at a station, the crew must discuss the platform work and the steps necessary to ensure the train's doors can be safely operated at the station.

FRA invited comment from the railroad industry and the greater public on how this safety briefing should occur, but did not receive any comments during the comment period. Nonetheless, FRA makes clear that the safety briefing may be made part of other safety briefings or discussions involving the operation of the passenger train, provided each crewmember's role in the safe operation and use of the exterior side doors is clearly established.

Paragraph (b) requires all passenger train exterior side doors and trap doors to be closed when a train is moving between stations, except as provided in paragraphs (b)(1) and (2). As stated previously in Section III, Discussion of Specific Comments and Conclusions, above, FRA received comments from SEPTA and Veolia regarding this paragraph. Both SEPTA and Veolia asked FRA to allow additional circumstances when

passenger train exterior side doors and trap doors may be open when a train is moving between stations. As previously explained, FRA declines to establish additional, generally-applicable exceptions beyond what is provided in paragraphs (b)(1) and (2). However, FRA is providing additional time for railroads to comply. Paragraph applies after April 5, 2016, or 60 days after the final rule takes effect. As proposed, paragraph (b) would have become applicable when the final rule took effect. In particular, this additional time will facilitate the process for SEPTA, Veolia, and any other entity to seek relief from the requirements of § 238.135(b) by applying for special approval under § 238.135(c) from FRA's Associate Administrator for Railroad Safety/Chief Safety Officer. Section 238.135(c) allows FRA to make individualized determinations that tailor any additional exceptions to the specific circumstances involved and the safety of the affected passengers and train crews. For more discussion of SEPTA's and Veolia's comments on this rulemaking, and FRA's response, see the Discussion of Specific Comments and Conclusions, Section III.

Paragraph (b)(1) allows a passenger train to depart from or arrive at a station with an exterior side door or trap door open when a crewmember needs to observe the station platform (paragraph (b)(1)(i)) and the open door is attended by the crewmember (paragraph (b)(1)(ii)). For instance, observing the station platform is necessary when arriving at stations so that crewmembers can determine if their train is properly positioned along the platform before opening the exterior side doors. In addition, crewmembers may need to open an exterior side door on their train to observe the station platform to help ensure the safety of late-boarding passengers for station departures.

With a crewmember stationed at each open exterior side door or trap door when departing from or arriving at a station, the train crew can better protect passengers from placing themselves in harm's way and more quickly react to an emergency occurring on the station platform.

Paragraph (b)(2) allows a passenger train to move between stations with its exterior side doors and trap doors open when a crewmember must perform on-ground functions. On-ground functions include, but are not limited to, lining switches, making up or splitting the train, providing crossing protection, and inspecting the train. This exception was created because the Door Safety Subgroup thought it would be too cumbersome and an undue hardship on passenger railroads to require them to operate their trains with their exterior side doors and trap doors closed when performing on-ground functions. For example, passenger train conductors often have to exit and reenter their trains several times when lining switches to establish the proper track route for their trains. However, FRA expects that crewmembers will close any such open exterior side doors or trap doors on their trains as soon as it is practical after completing the necessary on-ground functions.

As discussed above, paragraph (c) requires that passenger railroads receive approval from FRA's Associate Administrator for Railroad Safety/Chief Safety Officer to operate passenger trains with their exterior side doors or trap doors, or both, open between stations except as provided in paragraph (b) of this section. Any request to FRA must include: a written justification explaining why the passenger railroad needs to operate its trains in this manner (paragraph (c)(2)(i)); and a detailed hazard analysis

conducted by the railroad analyzing the hazards of running its trains in this manner, including specific mitigations to reduce the safety risk to passengers and train crews (paragraph (c)(2)(ii)). The chief executive officer (CEO), or equivalent, of the organization(s) making the request must sign the request (paragraph (c)(3)). In addition, FRA added paragraph (c)(4) to this final rule to clarify that railroads may need to submit other documents and different types of information to support the request. Passenger railroads must seek this special approval from FRA before operating trains in the requested manner, so that FRA can determine if passengers and train crews riding on such trains are adequately safeguarded against personal injury. FRA makes clear that if a passenger railroad must take additional steps to adequately safeguard passengers and train crews against personal injury, FRA may condition the grant of any special approval on the implementation of any such measures within the timeframes in the approval.

Paragraph (d) requires railroads to adopt and comply with operating rules on how to safely override a door summary circuit or a no-motion system, or both, if there is an en route exterior side door failure or malfunction on a passenger train. Under this section's requirements, the railroads must provide these written rules to their employees and make them available for FRA inspection. The written rules must include: (1) instructions to crewmembers and control center personnel describing what conditions must be present to override the door summary circuit or the no-motion system, or both (paragraph (d)(1)); and (2) steps crewmembers and control center personnel must take after the door summary circuit or no-motion system, or both, have been overridden, to help ensure continued passenger safety (paragraph (d)(2)). These paragraphs are intended to ensure a

mechanism exists to communicate that a defect has occurred in a critical safety system on a passenger train and that passenger safety continues to be provided after the critical safety system is overridden.

FRA is allowing a three-year period for the requirements in this paragraph to be implemented. FRA believes this three-year period will provide railroads with adequate time to develop and train their crewmembers and control center personnel on the operating rules and instructions, and minimize any cost. FRA wants to make clear that the term “control center personnel” in this final rule includes both railroad employees and railroad contractors and subcontractors who perform control center functions. See § 238.9(c). Use of the term “control center personnel” is also consistent with 49 CFR part 239, Passenger Train Emergency Preparedness, which uses the term “control center personnel” to describe the same persons. While crewmembers will continue to have the majority of the responsibilities under this section, control center personnel play an important role in how to safely override a door summary circuit or no-motion system, or both.

Paragraph (e) requires each crewmember to be trained on: (1) the requirements in this section; and (2) how to identify and isolate equipment with a malfunctioning exterior powered or manual side door. For example, FRA expects that this training will cover how a crewmember determines which exterior side door is malfunctioning. FRA believes that training crewmembers is necessary to ensure that a passenger train’s door safety systems are utilized to their designed level of safety. Crewmembers operating

exterior side doors on passenger trains and tasked with providing passenger safety must understand the safety risks involved in the use and operation of exterior side doors.

FRA makes clear that these requirements apply to both manual and powered exterior side doors. FRA is allowing a three-year period for railroads to implement the requirements of this paragraph. This three-year period affords the railroads adequate time to train their crewmembers and minimize any cost.

Paragraph (f) requires each railroad to adopt and comply with operating rules requiring its crewmembers to determine the status of their train's exterior side doors so their train may safely depart a station. In particular, this paragraph requires crewmembers to determine there are no obstructions in their passenger train's exterior side doors before the train departs. This operating rule requirement will safeguard against passengers becoming entangled in the exterior side doors of a train when boarding and alighting the train. FRA is allowing railroads a three-year period to implement the requirements of this paragraph. In the NPRM, this requirement was proposed under § 238.135(g). However, in this final rule FRA has switched proposed §§ 238.135(f) and (g) because it flows logically that requirements about operating rules should come before requirements for conducting tests on those rules.

Paragraph (g) requires that each railroad periodically conduct operational (efficiency) tests and observations of its operating crewmembers and control center personnel to determine each individual's proficiency with the side door safety procedures for both the railroad's exterior powered and manual passenger train side doors. FRA recognizes the critical role control center personnel have in ensuring the safe movement

of trains. These individuals must receive operational (efficiency) testing appropriate to their role providing door operations support to train crews. For example, control center personnel must understand the implications of a crew's activation of a door by-pass device. Due to additional safety precautions the crew must take, a train might need extra time at station platforms to allow for the safe boarding and alighting of passengers, which may affect the crew's ability to adhere to the train schedule. Control center personnel must be prepared to respond appropriately to safely direct train movements.

As in paragraph (e), FRA makes clear that this paragraph applies to both manual and powered exterior side doors. The rule provides railroads a three-year implementation period before requiring them to conduct operational (efficiency) tests and observations of their operating crewmembers and control center personnel to determine each individual's knowledge of the specific railroad's powered and manual exterior side door safety procedures for its passenger trains. This three-year implementation period affords the railroads adequate time to train and then begin testing their crewmembers and control center personnel on exterior side door safety procedures, and minimize any expense.

Finally, as stated above, this requirement was proposed under § 238.135(f) in the NPRM. However, in this final rule FRA has switched proposed §§ 238.135(f) and (g) for clarity.

#### Section 238.137 Mixed Consist; Operating Equipment with Incompatible Exterior Side Door Systems

FRA is adding this new section to part 238. FRA modified the language proposed in the NPRM for each paragraph of this section to clarify FRA's intent regarding each

paragraph. Through this section, FRA is creating a positive requirement for railroads to take action to ensure that when they operate “mixed consist” trains, they operate them safely. In addition, FRA is also modifying the language proposed in paragraph (b) to clarify that entities subject to the requirements of this rule must adopt and comply with operating rules to ensure the safe operation of mixed consist trains. Each paragraph is addressed below.

Paragraph (a) requires a train made up of equipment with incompatible exterior side door systems to be operated within the constraints of each exterior side door safety system on the train. As evidenced by FRA’s safety assessment of passenger railroad door systems across the country, some passenger railroads mix and match different models of passenger cars with different door safety systems when they assemble individual trains. These trains are referred to as mixed consists and can contain passenger cars with different types of exterior side doors, such as manual and powered doors. They can also be comprised of passenger cars with different models or types of powered exterior side doors that are not compatible with each other’s door safety system. Because the door safety systems on mixed consist trains are not able to properly communicate the presence of an obstruction in a door, or the door’s status otherwise, this paragraph requires train crewmembers to take extra steps to enhance passenger safety to a level at least equivalent to a train operating with compatible exterior side door systems. In this regard, FRA notes that in mixed consist trains with both manual and powered exterior side doors, the manual exterior side doors require extra attention by crewmembers to ensure that they are

closed and it is safe to depart. In addition, FRA slightly modified the proposed language for this paragraph in this final rule to state the requirement more clearly.

Paragraph (b) requires railroads to adopt and comply with operating rules to provide for the safe use of passenger cars and locomotives used in passenger service with incompatible exterior side door safety systems when they are operated together in a mixed consist train. Once the operating rules have been adopted, complying with these rules will ensure the mixed consist train is operated with at least the same level of safety as a train with compatible exterior side door safety systems, even though the door safety systems on the various cars are incompatible. These rules must take into consideration the constraints of the door systems of the equipment operated by the railroad. For example, the operation of a mixed consist train may require additional measures to help ensure passenger safety, such as operating rules on crew positioning or providing a second look at the station platform to determine whether it is safe for the train to depart a station.

FRA also modified the proposed language in this paragraph to clarify its requirements. The modified language makes the regulatory language consistent with the regulatory language for § 238.135(d) and (g) in this final rule, which also contain requirements involving railroad operating rules.

#### Appendix A to Part 238—Schedule of Civil Penalties

This appendix contains a schedule of civil penalties for use to enforce this part. Because such penalty schedules are statements of agency policy, notice and comment are

not required prior to their issuance. See 5 U.S.C. 553(b)(3)(A). Nevertheless, FRA invited comment on the penalty schedule. However, FRA did not receive any comments.

Accordingly, FRA is amending the penalty schedule to reflect the addition of the following sections to this part: § 238.131, Exterior side door safety systems—new passenger cars and locomotives used in passenger service; § 238.133, Exterior side door safety systems—all passenger cars and locomotives used in a passenger service; § 238.135, Operating practices for exterior side door safety systems; and § 238.137, Mixed consist; operating equipment with incompatible exterior side door systems.

## **VI. Regulatory Impact and Notices**

### **A. Executive Orders 12866 and 13563 and DOT Regulatory Policies and Procedures**

This final rule has been evaluated in accordance with Executive Order 12866 (*Regulatory Planning and Review*), Executive Order 13563 (*Improving Regulation and Regulatory Review*), and DOT policies and procedures. A regulatory evaluation has been prepared addressing the economic impact of the final rule over a 20-year period. The economic impacts of the final rule are estimated at well under \$100 million per year. This section summarizes the economic impacts of the final rule.

The intent of the final regulation is to increase safety by reducing the injuries caused by the operation of a passenger train's exterior side doors. The doors can cause injuries to passengers from striking or holding them as they board or alight from trains. These injuries are unintended consequences that result from normal train operations. Railroad rules governing the operation of the doors may not provide adequate information to crewmembers, for example, about when and how to use door by-pass

devices and the interaction of the doors with other train systems. Although most passenger trips occur without a door incident, the consequences of improper door operations can and have resulted in serious harm and even death. In November 2006, a passenger died after being caught in the doors of a departing NJT train at the Bradley Beach, NJ station.

FRA intends to reduce door incidents and injuries in two ways. First, the final rule addresses the railroads' rules and procedures for operating doors. The final rule requires railroads to have and implement operating rules for their employees that emphasize understanding the capabilities and limits of the door safety systems installed on the passenger cars and connected locomotives used in passenger service that they operate. The overall intent of the operating rules requirement is that the train crew should be aware of the status of the door safety systems on their train, such as if the train is operating in by-pass mode (which overrides certain door safety features), if a door is locked-out because of a malfunction, or if they are working on trains that have cars with different door safety systems. Specific requirements include the need for the train crew to verify that the door by-pass devices are sealed on the train they are operating, to report instances when a by-pass device is found unsealed, and to understand crew responsibilities to safely operate the train when by-pass mode has been activated. The final rule also contains provisions to mitigate existing practices that may unintentionally increase the risk of door-caused injuries. For example, the final rule requires door control panels (used to open and close the doors) to become and remain inactive if a door control key or some other secure device is removed from the panel. Also, if switches are used to

denote the end of the train circuit, then these switches need to be secured. Securing the switches used to denote the end of the train reduces the opportunity for part of the train to be cut-off from the summary circuit and be left unprotected by the door safety system (a situation which could occur if the end-of-train circuit switches are activated at some location other than at the actual end of the train). Additionally, FRA is concerned about the inherent risk posed by a few railroads' practice of running trains with the doors open between stations. However, FRA allows railroads the flexibility to continue the practice, but only by special approval supported by a hazard analysis including risk mitigation measures. Other requirements for operating rules task the crew with determining that the doors are free of obstructions so that the train may safely depart a station, and with procedures for safely operating trains that consist of mixed passenger cars and locomotives used in passenger service, such as cars with different door systems. For these operating rules and operating rules describing procedures to maintain safety when the train is in by-pass mode, FRA allows three years for implementing compliance. Passenger railroads also have a three-year period to train crewmembers on these operating rules. To determine that the employees understand such operating rules, railroads have three years to begin conducting periodic operational (efficiency) tests of its crewmembers and control center personnel, as appropriate to their roles ensuring the safe operation of the exterior side doors and the door by-pass devices.

The second part of the final rule concerns requirements for doors on new passenger cars and connected locomotives used in passenger service. FRA is adopting the APTA Standard discussed above containing the design requirements for door safety

systems on new passenger cars ordered with powered exterior side doors, and for connected door safety systems on new locomotives used in passenger service. For example, new cars with powered exterior side doors need an obstruction detection system, a key or other secure device to activate (i.e., turn on) a door control panel, and the doors may not close or open by moving the locomotive throttle control (i.e., the doors should be controlled by the crew instead of by the movement of the train). The Standard is structured in a hierarchical order, addressing the door safety features at the individual door level through the overall system level. The Standard is structured this way to potentially prevent or mitigate unsafe door conditions at one of several levels. This structure also provides railroads flexibility to determine the most appropriate equipment design for their particular operations. In this way, the Standard is performance-based. Additionally, the final rule includes some minimum safety standards for manual and powered exterior side doors on new passenger cars and for connected door safety systems on new locomotives used in passenger service. These types of new passenger equipment need to have a door summary circuit that prevents the train from taking power and moving if an exterior side door is open. Other safety requirements that apply to new cars with either powered or manual exterior side doors are door status lights or indicators, a door summary status indicator or light that is easily viewable by the engineer, and bypass devices that work only when activated from the operating cab of the train. The final rule notes that these requirements for passenger trains with manual or powered doors apply to both commuter and intercity passenger service railroads (but not to private equipment).

FRA is requiring additional door safety features on new cars and connected locomotives. These safety features can be installed more cost-effectively in such new equipment compared to potentially requiring the retrofit of existing equipment. These safety features on new cars and connected locomotives are all currently available.

FRA analyzed the economic impacts of this rule against a “no action” baseline. The no action baseline reflects the state of the world in the absence of this final rule. The estimated costs resulting from the final rule over the 20-year period of analysis total \$15.2 million undiscounted, with a present value of about \$8.3 million calculated using a 7-percent discount rate (PV, 7%), and a present value of \$11.5 million calculated using a 3-percent discount rate (PV, 3%). The estimated quantified benefits over a 20-year period total \$83.9 million undiscounted, \$43.3 million (PV, 7%), and \$61.7 million (PV, 3%). These costs and benefits result in net positive benefits over 20 years of about \$68.7 million undiscounted, \$35.0 million (PV, 7%), and \$50.2 million (PV, 3%).

In the regulatory evaluation accompanying the final rule, the burdens accounted for remain primarily the same as in the regulatory evaluation accompanying the proposed rule. The most significant change was expanding the costs resulting from section 238.135(c), which requires railroads to receive special approval from FRA to operate passenger trains with open doors between stations in circumstances other than those specifically allowed by the rule. The costs for this provision were expanded to include potential mitigations that a railroad may have to put in place to reduce the risk to passengers. In addition, after the proposed regulatory evaluation was published, DOT issued new guidance in June 2014 for the value of a statistical life that is used in

estimating benefits. The guidance also updated the median growth rate in wages that affects the cost estimates. The costs and benefits have been revised in the final regulatory evaluation to reflect this new guidance. Also, the start of the period of analysis, i.e., year 1, has been changed from 2014 to 2015 to reflect the passage of time since the proposed rule was published. These changes are explained in the final regulatory evaluation accompanying the final rule. Furthermore, DOT again revised the value of a statistical life guidance in June 2015 for analyses prepared in 2015. The June 2015 guidance increases the value of a statistical life from \$9.2 million to \$9.4 million. The new value would not alter the benefits or costs enough to change the resulting net-benefit outcome for this final rule. As the final regulatory evaluation updates the 2014 analysis for the proposed rule, and the benefit-cost decisions would not be affected by the new DOT guidance, this final analysis continues to use the DOT guidance for the value of a statistical life issued in June 2014 for estimating impacts.

The final rule incurs relatively small costs and therefore has relatively high net benefits. Most of the initial burdens are expected from changes to railroad operating rules, and from the safety standards for door safety systems on new passenger trains where they can be installed cost-effectively. The largest contributor to costs is the crewmembers' task of verifying that the door by-pass devices on the train are sealed in the normal, non-by-pass mode. The quantified benefits result primarily from reduced injuries based on a count of door injuries in the past (2001-2005), and the assumption that the final rule would be 50-percent effective in reducing similar injuries and fatalities in the future. The count of door injuries used the descriptive, narrative statements on

accident reports to better identify door-caused injuries (yielding about 19 potentially avoided injuries per year on average). A count of door-caused injuries using more recent data from 2011 yielded 19 injuries, similar to the average of previous years' results. There may be other additional benefits that were not quantified, such as fewer passenger claims for personal property damage. Also, as door incidents are often well-publicized in the media, reducing the number of door incidents will maintain and enhance the public's perception of safe passenger service, or goodwill toward passenger service. Furthermore, railroads for which the APTA standard may serve as an incentive to purchase new cars may have reduced door system maintenance costs as a result, as newer passenger cars can be expected to have more reliable door systems than older cars.

The costs and benefits are summarized in the tables Costs Summary and Benefits Summary, respectively.

TABLE: COSTS SUMMARY

Final Rule Reference (and Regulatory Evaluation Reference)	Cost Category	Total Undiscounted Costs	Total Present Value of Costs Discounted at 7%	Total Present Value of Costs Discounted at 3%
238.133(a) (8.2(a)), By-Pass Device Verification.	Verify Door By-Pass Devices Are Sealed and Ensure Integrity of the Train.	\$11,140,576	<b>\$5,499,252</b>	\$8,032,569
238.133(a) (8.2(a)), Developing a Written Functional Test Plan.	As an Alternative, Develop a Written Functional Test Plan to Comply with 238.131(a) By-Pass Device Verification.	\$9,805	<b>\$8,085</b>	\$8,913
238.133(b) (8.2(b)), Unsealed Door By-Pass	Apply Seal to Door By-Pass Devices when Found Unsealed, Report	\$557,029	<b>\$274,963</b>	\$401,628

Device.	Defect.			
238.133(c) (8.2(c)), En Route Failure.	Determine if Safe to Proceed with Door By-Pass Activated, and Hold Crew Safety Briefing.	\$78,093	<b>\$40,723</b>	\$57,686
238.133(d) (8.2(d)), Records.	Record the Door By-Pass Activation.	\$13,051	<b>\$6,806</b>	\$9,640
238.133(d) (8.2(d)), Records.	Record Unintended Door Openings.	\$52,203	<b>\$27,222</b>	\$38,561
238.133(e) (8.2(e)), Door Control Panels.	Average of Engineering and Operating Rule Solutions to Prevent Unauthorized Access to Door Control Panels.	$(0.5 * \$186,574) + (0.5 * \$26,839) = \$106,707$	$(0.5 * \$174,369) + (0.5 * \$24,186) =$ <b>\$99,277</b>	$(0.5 * \$181,140) + (0.5 * \$25,643) =$ \$103,391
238.133(f) (8.2(f)), End-of-Train Circuit.	Secure End-of-Train Circuit Switches, if Used.	\$205,635	<b>\$192,182</b>	\$199,645
238.133(g)(1) (8.2(g)(1)), Exterior Side Door Safety System Override Devices.	Seal By-Pass Devices, if so Equipped.	Accounted for in Sections 238.133(a), 238.133(b), and 238.133(g)(2).		
238.133(g)(2) (8.2(g)(2)), Calendar Day Inspection.	Verify Door By-Pass Devices Sealed; Cost for Events Requiring Additional Troubleshooting.	\$79,467	<b>\$41,440</b>	\$58,701
238.135(a) (8.3(a)), Participate in Daily Safety/Job Briefing.	Emphasize Crew Responsibilities for Safe Door Operations.	Can Combine with Other Safety Briefings, Minimal Marginal Cost.		
238.135(b), 238.135(c) (8.3(b), 8.3(c)), Operate with the Exterior Side Doors and Traps Closed when Traveling Between	Railroads that File a Written Justification with FRA Requesting Special Approval to Operate with the Exterior Side Doors Open Between Stations, Install Typical Risk	File Justification = \$3,122, Install Typical Mitigations = \$150,000, Total = \$153,122	<b>File Justification = \$2,918, Install Typical Mitigations = \$140,187, Total = \$143,105</b>	File Justification = \$3,031, Install Typical Mitigations = \$145,631, Total = \$148,662

Stations, and Special Approval to do so.	Mitigations (Signage, Markings, Lighting)			
238.135(d), 238.135(f), 238.137(b) (8.3.1), Develop Operating Rules, Mixed Consist.	Developing Operating Rules for Overriding Door Safety Systems, Determining That Passengers are Clear of the Doors, and Operating a Train with Incompatible Door Safety Systems.	\$153,632	<b>\$107,862</b>	\$130,219
238.135(d) (8.3.1), Additional Requirement to Provide Written Operating Rules for By-Pass.	Provide Written Operating Rules to Crewmembers and Control Center Personnel for Safely Overriding Door Safety Systems, Allow Time for These Affected Individuals to Read Operating Rules.	Enter, Copy, Distribute Rules = \$2,199, Read = \$100,591, Total = \$102,790	<b>Enter, Copy, Distribute = \$1,487, Read = \$67,678, Total = \$69,165</b>	Enter, Copy, Distribute = \$1,836, Read = \$83,807, Total = \$85,642
238.135(e) (8.3.2), Training.	Review and Revise Existing Training Plans for Training on Exterior Side Door Safety Systems and Operating Rules, Perform Training.	Review and Revise Training Plans = \$11,235, Perform Training = \$576,540, Total = \$587,776	<b>Review and Revise Training Plans = \$8,547, Perform Training = \$391,380, Total = \$399,927</b>	Review and Revise Training Plans = \$9,910, Perform Training = \$482,143, Total = \$492,053
238.135(g) (8.3.2), Operational (Efficiency) Tests and Observations.	Conduct Operational (Efficiency) Testing for Exterior Side Door Safety Procedures.	\$116,019	<b>\$52,666</b>	\$81,067
238.131(a) (8.4), New Passenger Cars and Loco's Used in Passenger Service, Safety Systems for Powered	Implement APTA Standard for Powered Exterior Side Door Systems on New Passenger Cars and Connected Loco's Used in Passenger Service.	\$300,000	<b>\$280,374</b>	\$291,262

Exterior Side Doors.				
238.131(b) (8.5.1), Manual and Powered Door System Standards for New Passenger Equipment.	Implement Some Safety Features for New Passenger Cars With Either Powered or Manual Exterior Side Doors and Connected Loco's Used in Passenger Service.	\$1,576,608	<b>\$1,068,506</b>	\$1,328,884
TOTAL		\$15,232,512	<b>\$8,311,555</b>	\$11,468,527

TABLE: BENEFITS SUMMARY

Rule Year	(VSL=\$9.2 million) AIS Level Dollar Value	Est. Reduction in Injuries, Monetary Value	Est. Reduction in Injuries, Monetary Value at 50% Effectiveness	Est. Reduction in Fatalities, Monetary Value at 50% Effectiveness	Total Value of Reductions in Injuries and Fatalities
1	\$301,389	\$5,605,832	\$2,802,916	\$941,840	\$3,744,756
2	\$304,945	\$5,671,981	\$2,835,991	\$952,954	\$3,788,944
3	\$308,544	\$5,738,910	\$2,869,455	\$964,199	\$3,833,654
4	\$312,184	\$5,806,630	\$2,903,315	\$975,576	\$3,878,891
5	\$315,868	\$5,875,148	\$2,937,574	\$987,088	\$3,924,662
6	\$319,595	\$5,944,475	\$2,972,237	\$998,736	\$3,970,973
7	\$323,367	\$6,014,619	\$3,007,310	\$1,010,521	\$4,017,830
8	\$327,182	\$6,085,592	\$3,042,796	\$1,022,445	\$4,065,241
9	\$331,043	\$6,157,402	\$3,078,701	\$1,034,510	\$4,113,211
10	\$334,949	\$6,230,059	\$3,115,030	\$1,046,717	\$4,161,747
11	\$338,902	\$6,303,574	\$3,151,787	\$1,059,068	\$4,210,855
12	\$342,901	\$6,377,956	\$3,188,978	\$1,071,565	\$4,260,543
13	\$346,947	\$6,453,216	\$3,226,608	\$1,084,210	\$4,310,818
14	\$351,041	\$6,529,364	\$3,264,682	\$1,097,003	\$4,361,685
15	\$355,183	\$6,606,410	\$3,303,205	\$1,109,948	\$4,413,153
16	\$359,375	\$6,684,366	\$3,342,183	\$1,123,045	\$4,465,228
17	\$363,615	\$6,763,242	\$3,381,621	\$1,136,297	\$4,517,918
18	\$367,906	\$6,843,048	\$3,421,524	\$1,149,706	\$4,571,230
19	\$372,247	\$6,923,796	\$3,461,898	\$1,163,272	\$4,625,170
20	\$376,640	\$7,005,497	\$3,502,748	\$1,176,999	\$4,679,747
Total undiscounted			\$62,810,558	\$21,105,698	\$83,916,257

Total PV @ 7%		\$32,423,683	\$10,895,055	\$43,318,737
Total PV @ 3%		\$46,189,262	\$15,520,585	\$61,709,847

Notes:

Average estimated reduction in injuries = 18.6 injuries per year.

Average estimated reduction in fatalities = 0.20 fatalities per year.

Average Abbreviated Injury Scale (AIS) level for door injuries = 1.67

Value of a Statistical Life (VSL) = \$9.2 million in base year 2013, increased at a rate of 1.18 percent annually, to equal \$9.4 million in rule year 1.

PV = Present Value.

B. Regulatory Flexibility Act and Executive Order 13272; Certification of No Significant Economic Impact on a Substantial Number of Small Entities

The Regulatory Flexibility Act of 1980 (RFA) (5 U.S.C. 601 et seq.) and Executive Order 13272 (67 FR 53461, Aug. 16, 2002) require agency review of proposed and final rules to assess their impacts on small entities. An agency must conduct an initial regulatory flexibility analysis (IRFA) unless it determines and certifies that a proposed rule does not have a significant economic impact on a substantial number of small entities. When an agency prepares a final rule, the agency needs to prepare a final regulatory flexibility analysis (FRFA), or if a FRFA is not prepared, the head of the agency must certify that the final rule will not have a significant economic impact on a substantial number of small entities. See 5 U.S.C. 604(a) and 605(b).

FRA prepared an IRFA at the time the proposed passenger door rule was published in the Federal Register. FRA requested comment on potential small business impacts of the requirements in the proposed rule. No small entities submitted public comments, nor did anyone submit comments regarding the costs of the proposed rule on small entities.

However, stakeholders submitted four comments about the requirements in the NPRM. Sensotech, Inc. wanted FRA to consider Sensotech's acoustic technology for a door safety system. In response, FRA notes that it leaves the specific type of technologies used for door safety systems up to the discretion of the regulated entities. A regulated entity can choose the technology that is most cost-effective for its operations to comply with the final rule's requirements. In its comment, SEPTA asked for an additional exception from § 238.135(b). Section 238.135(b) generally requires side and trap doors to remain closed as the train travels between stations. SEPTA has operational concerns with this requirement. Veolia also expressed concern about the same section of the rule. Veolia uses a procedure that requires a conductor to verify a signal indication at a particular location. In order to verify the signal indication, Veolia believes a conductor may have to open a door while the train is moving. Veolia asked for clarification about whether its procedure would violate § 238.135(b). For both commenters, FRA responds that there are exceptions in § 238.135(b) for crew observations of a station platform and for on-ground functions such as lining switches. Furthermore, if a railroad does not qualify for the exceptions in § 238.135(b), a railroad may apply for relief under § 238.135(c). Rather than create an additional permanent exception in the final rule, FRA believes that the process in § 238.135(c) is the appropriate way to consider exceptions. Finally, one anonymous person commented about hours of service issues in the trucking industry and a Federal Motor Carrier Safety Administration proposal. Since the comment does not apply to this passenger door safety rulemaking, FRA is not addressing this

comment in this final rule. The full text of the comments can be found in the public docket for this rulemaking on [www.regulations.gov](http://www.regulations.gov).

FRA made no changes in the final rule for these public comments but did revise the regulatory language in a few sections for clarity. Some clarifications for particular sections of the rule are discussed below.

In § 238.135(a) about the crew participating in daily safety/job briefings, FRA added language to clarify that the safety briefing must discuss safe operation of the doors for situations that the crew may encounter throughout the duty hour. For example, if there was work being done on a station platform so that a portion of the platform was not available, the crew would need to discuss safely operating the doors when arriving or departing that station. The regulatory analysis for the proposed rule assumed that job briefings currently cover the variety of door-related tasks that the crew performs, including safe door operations. Both the proposed and final rules add emphasis for the crew to be aware of safe door procedures, which will reasonably include discussing situations along their route that could affect door safety. This briefing could be combined with existing safety briefings at minimal extra cost. No change is therefore made to the previous cost estimates in the proposed rule.

Section 238.135(c) was modified to make it explicit that FRA may request additional information from a railroad in support of its request to operate with the doors open in circumstances other than those allowed under § 238.135(b). FRA expects only a few railroads to make such a request, none of them small entities. In addition, the regulatory analysis accompanying the NPRM already allocated time for a substantive,

well-documented request, minimizing the effort that would be needed to gather additional supporting documentation.

Sections 238.137(a) and (b) concern operation of trains with mixed equipment, such as cars with different door safety systems. In the final rule, FRA is clarifying the language to make it clear that railroads must not only adopt such rules, but comply with them. In the regulatory evaluation for the proposed rule, the costs for operating rules for mixed consist trains were accounted for along with the other operating rules. Thus, it was assumed that railroads would both adopt and comply with such rules. In addition, the regulatory evaluation could not claim benefits from the operating rules in terms of reduced injuries if the operating rules were not actually used. The compliance costs result from training crewmembers in the operating rules. These costs were already accounted for in the proposed regulatory evaluation and no change in this burden is made in the final regulatory evaluation.

In discussing changes to the final regulatory evaluation, the type of burdens accounted for remain primarily the same as in the proposed rule regulatory evaluation. However, after the proposed regulatory evaluation was published, DOT issued new guidance for the value of a statistical life that is used in estimating benefits. The guidance also updated the median growth rate in wages that affects the cost estimates. The costs and benefits have been revised in the final regulatory evaluation to reflect this new guidance. Also, the start of the period of analysis, i.e., year 1, has been changed from 2014 to 2015 to reflect the passage of time since the proposed rule was published.

These changes are explained in the final regulatory evaluation prepared to accompany the final rule.

The analysis to support that the final rule will not have a significant economic impact on a substantial number of small entities is presented after some information about the final rule to aid discussion.

1. Reasons for Considering Agency Action.

As background, and as noted in the IRFA, the primary goal of this rulemaking is to improve the safety of passengers and employees on intercity passenger and commuter trains as they board and alight through the exterior side doors of passenger cars. For convenience, unless otherwise specified, “doors” in this analysis refers to the exterior side doors intended and normally used by passengers for boarding and alighting from the train. For most train operations, passengers use these doors getting on and off the train without incident. They generally take for granted that the doors will function safely. However, there have been some casualties that have occurred in the past, some of which had tragic consequences. These injuries and fatalities are unintended, harmful consequences to passengers and employees that have resulted from normal train operations.

Most passengers and employees have an expectation that the train exterior side doors will function safely when boarding and alighting from the train. Therefore, passengers and employees may not properly assess the potential safety risks of a door problem because door incidents are low-frequency, but potentially high-consequence events. Passengers and employees may not have all the necessary information about how

a train's exterior side doors will operate in case of a problem. This information gap affects the passengers' interaction with the doors and the employees' control of the doors. For example, passengers may assume passenger train exterior side doors will bounce back continuously when an obstruction prevents the doors from closing like most elevator doors do. However, not all passenger train cars are equipped with this safety feature. Additionally, employees might not know whether the exterior side doors on a train will open or close when there has been an interruption in power. Furthermore, for trains that use marker light switches to denote the end of the train, employees may not know that activating these switches at a point other than the physical end of the train will complete the trainline door circuit at that car. This situation would effectively leave the passenger cars after the car with the marker light switch on without any exterior side door safety features.

This final rule will improve railroad safety through regulatory language establishing new design requirements, and requirements for operating practices for the use of exterior side door safety systems on passenger cars and connected locomotives. Specifically, this final rule incorporates by reference the standards for powered exterior side door safety systems on new passenger cars and connected door safety systems on new locomotives used in passenger service, from the APTA Standard PR-M-S-18-10 ("Standard for Powered Exterior Side Door System Design for New Passenger Cars"), discussed above.

## 2. Description of Regulated Entities.

The “universe” of the entities considered generally includes only those small entities that can reasonably be expected to be directly regulated by this action. Small railroads that provide passenger service are the only types of small entities that may be affected directly by this final rule.

“Small entity” is defined in 5 U.S.C. 601(3) as having the same meaning as “small business concern” under section 3 of the Small Business Act. This definition includes any small business concern that is independently owned and operated, and is not dominant in its field of operation. Section 601(4) likewise includes within the definition of “small entities” not-for-profit enterprises that are independently owned and operated, and are not dominant in their field of operation.

The U.S. Small Business Administration (SBA) stipulates in its size standards that the largest a railroad business firm that is “for profit” may be and still be classified as a “small entity” is 1,500 employees for “Line Haul Operating Railroads” and 500 employees for “Switching and Terminal Establishments.” Additionally, 5 U.S.C. 601(5) defines as “small entities” governments of cities, counties, towns, townships, villages, school districts, or special districts with populations less than 50,000.

Some passenger railroads use contractors to perform many different functions on their railroads. For some passenger railroads, contractors operate trains and perform other safety-related functions. The contract operators are typically large freight railroads, large transportation companies, or Amtrak (a Class I railroad), which perform primary operating and maintenance functions for the passenger railroads. For the purpose of assessing this final rule’s impact, the pertinent contractors are all larger contractors who

perform primary operating and maintenance functions for the passenger railroads. Conversely, smaller contractors perform ancillary functions to the primary operations. The large transportation companies that are contractors are typically substantial private companies such as Herzog Transit Services, Inc., or part of an international conglomerate such as Keolis S.A. Group or Veolia Environnement S.A. These international conglomerates have substantial multidisciplinary workforces and can perform most to all of the operating functions the passenger railroad requires.

Federal agencies may adopt their own size standards for small entities in consultation with SBA and in conjunction with public comment. Under that authority, FRA has published a final statement of agency policy that formally establishes “small entities” or “small businesses” as being railroads, contractors, and hazardous materials shippers that meet the revenue requirements of a Class III railroad as set forth in 49 CFR 1201.1-1, which is \$20 million or less in inflation-adjusted annual revenues, and commuter railroads or small governmental jurisdictions that serve populations of 50,000 or less. See 68 FR 24891, May 9, 2003, codified as appendix C to 49 CFR part 209. The \$20 million limit is based on the Surface Transportation Board’s revenue threshold for a Class III railroad. Railroad revenue is adjusted for inflation by applying a revenue deflator formula in accordance with 49 CFR 1201.1-1. FRA is using this definition for this rulemaking.

3. Railroads Impacted.

All railroads that provide intercity, or commuter or other short-haul, passenger train service, as provided in 49 CFR 238.3 (Applicability), will have to comply with all

the provisions in this final rule. However, the effort to comply with this final rule is commensurate with the size of the entity, the number of trains the entity operates, the number of employees the railroad employs, and the railroad's current operating rules for the operation of its trains' exterior side doors. Tourist, historic, and excursion railroads are exempt from this final rule. See 49 CFR 238.3.

For purposes of this analysis, there are two intercity passenger railroads, Amtrak and the Alaska Railroad Corporation. Neither is considered a small entity. Amtrak is a Class I railroad and therefore not a small railroad. The Alaska Railroad is a Class II railroad and also not considered to be a small railroad per the definition of small entity in FRA's published statement of agency policy referenced above. The Alaska Railroad is owned by the State of Alaska, which has a population well in excess of 50,000. Therefore, they are not considered small entities in this analysis.

In addition to the above intercity passenger railroads, there are currently 28 other railroads that provide passenger train service in the U.S. Most of these 28 railroads are part of larger transit organizations that receive Federal funds and serve major metropolitan areas with populations greater than 50,000. Therefore, most of these are not small entities.

However, two of these 28 railroads are considered small entities: the Saratoga & North Creek Railway (SNC), and the Hawkeye Express, which is operated by the Iowa Northern Railway Company (IANR). In 2011, Hawkeye Express transported approximately 5,000 passengers per game over a 7-mile round-trip distance to and from University of Iowa (University) football games. IANR owns and operates the six bi-level

passenger cars used for this small passenger operation which runs on average only seven days over a calendar year. IANR has approximately 100 employees and is primarily a freight operation totaling 184,385 freight train miles in 2010. The Hawkeye Express service has a contractual arrangement with the University, a State of Iowa institution located in Iowa City, Iowa. The population of Iowa City is approximately 69,000. The SNC began operation in the summer of 2011 and currently provides intermittent passenger train service over a 57-mile line between Saratoga Springs and North Creek, New York, making seven station stops in between. The SNC is a Class III railroad (i.e., below the \$20 million revenue threshold) and a limited liability company wholly owned by San Luis & Rio Grande Railroad (SLRG). SLRG is a Class III railroad and a subsidiary of Permian Basin Railways, Inc. (Permian). Permian is in turn owned by Iowa Pacific Holdings, LLC (IPH). The SNC primarily transports passengers to Saratoga Springs, tourists seeking to sightsee along the Hudson River, and travelers connecting to and from Amtrak service. It also operates special events trains. The SNC is involved with the operation of passenger trains year round using conventional locomotives in the lead, typically pulling consists of passenger coaches and other cars such as baggage cars and dining cars. The SNC has about 37 total employees, including about 7 engineers and conductors that are responsible for safe door operations under this final rule.

#### Substantial Number of Small Entities

There are two railroads that are considered small entities for purposes of this analysis and together they comprise about 7 percent of the railroads impacted directly by this regulation. Thus, 7 percent of the impacted railroads could be considered to be a

substantial number of small entities. However, these two small entities represent a much smaller portion of the total railroad industry impacted by this final rule. This is because of the small number of trains operated annually, or the small number of employees employed by these two railroads, or both.

#### No Significant Economic Impact

Some passenger railroads have voluntarily been in compliance with the requirements in this final rule for some time. FRA expects that most of the skills necessary to comply with the final rule are possessed by operating crew employees and recordkeeping and reporting personnel. For the affected small entities, the additional burden of the requirements is marginal. The nature of the operations of these two small entities indicates lower over-all costs to these railroads. The Hawkeye Express has a very limited operation in the number of days the railroad operates, the low number of cars (6 bi-level cars), and the total trips made by its trains. As a result, the costs for almost all of the final rule's burdens on the Hawkeye Express are low.<sup>5</sup> The SNC operates more trains and for more days than the Hawkeye Express, but has a low number of cars and limited number of trips. This type of operation will keep the costs from the final rule's requirements low. And, as discussed further below, the requirements applicable to purchasing new cars and locomotives do not have any impact on these two small entities because they do not purchase or order new passenger cars or passenger locomotives.

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<sup>5</sup> In addition, the Hawkeye Express provides service under contract to a State institution (i.e., the University). It may be able to pass some or all of the compliance cost on to that institution.

There are reporting, recordkeeping, and compliance burdens associated with this regulation. FRA estimates that the total cost of the final rule for the railroad industry over a 20-year period will be \$15.2 million (undiscounted)—\$8.3 million (discounted at 7 percent), or \$11.5 million (discounted at 3 percent). Based on information currently available, FRA estimates that 1 percent or less of the total railroad costs associated with implementing the final rule will be borne by small entities. FRA estimates that the approximate total cost for small railroads for the 20-year period could range between \$75,000 and \$151,000 (undiscounted) depending on discount rates and the extent of costs relative to larger railroads. FRA estimates impacts on these two railroads annually could range on average between \$950 and \$1900 to comply with the final rule. The cost to these two small entities will be considerably less on average than that of the other 28 railroads. FRA reasonably believes this will not be a significant economic burden. For a thorough presentation of cost estimates please refer to the regulatory evaluation, which is in the docket for this rulemaking.

Turning now to the economic impacts of specific provisions of the final rule, the regulatory evaluation estimates that the requirements in § 238.133(a) (crewmember door by-pass verification) are the largest cost for railroads, accounting for about two-thirds of total discounted costs. Section 238.133(a) requires verifying that the by-pass devices to override the door safety features are sealed in the normal, non-by-pass mode. The related provision in § 238.133(b) requires by-pass devices that are found unsealed to be reported and has conditions for replacing the seal; it accounts for about 3 percent of costs.

However, neither the Hawkeye Express nor SNC operates trains that use by-pass devices, and would therefore have no costs associated with this requirement.

The second most costly provision, accounting for about 16 percent of costs, is § 238.131, which implements door safety standards for new passenger cars and connected locomotives, including the industry APTA Standard. These requirements also do not impact these two small entities because they do not purchase or order new passenger cars or passenger locomotives. In fact, Hawkeye Express' operator owns the cars and locomotives. Due to the limited operations of both entities, and other factors, it is unlikely that these entities will purchase new passenger cars anytime in the near future. In addition, for all railroads, § 238.131 applies to new rail passenger cars and connected locomotives used in passenger service that are ordered on or after 120 days after the date this rule is published in the Federal Register, or placed into service for the first time on or after 790 days after the date the rule is published in the Federal Register. This time period gives the railroads sufficient time to reach compliance.

For § 238.135, the costs will vary for these two entities. For paragraph (b) of § 238.135, which generally requires exterior side doors and trap doors to be closed when the train is moving between stations, FRA does not anticipate any cost to these small entities because both railroads currently operate with their trains' exterior side doors closed between train stations.

Paragraphs (d) and (f) of § 238.135 are focused on the railroads having sufficient operating rules to ensure the safe operation of their trains' exterior side passenger doors. Paragraph (e) requires the passenger train crewmembers to be trained on the requirements

of the section (i.e., § 238.135), and paragraph (g) requires corresponding operational testing to demonstrate the crewmembers' and control center personnel's knowledge of the door operating rules. Likewise, paragraphs (a) and (b) of § 238.137 require railroads to adopt and comply with operating rules to provide for the safe use of equipment with incompatible exterior side door systems when utilized in a mixed consist. For most railroads some of these requirements will be new burdens with associated costs. Railroads will have to review their existing operating rules and training plans. However, crewmembers responsible for door operations (i.e., the engineer and conductor) would have received some training on door operations as part of their professional training and certification programs. Moreover, § 238.137 would not apply to most railroads because most railroads do not operate mixed consists.<sup>6</sup> Thus, the economic burdens for § 238.135(b) through (g), as well as § 238.137(a) and (b), depend on whether the railroads' current operating rules already include the door operation requirements in the final rule and whether they operate mixed consists.

The door safety features and their associated operating rules in the final rule are not new or novel procedures, but currently exist. All larger-volume passenger service railroads have some door operating rules; the smaller railroads may have less extensive door operating rules corresponding to the fewer types of equipment they run. In addition, for § 238.135(d) through (g), and § 238.137(b), FRA is giving railroads 1,095 days (3 years) after the date of publication of the final rule in the Federal Register to comply (or

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<sup>6</sup> For example, FRA observed that MARC and MBTA operated mixed consists.

begin to comply, for § 238.135(g)). Lastly, the cost of all these requirements for small business entities is estimated to be less than two percent of the total cost of the final rule.

#### Market and Competition Considerations.

The railroad industry has several significant barriers to entry, such as the need to own or otherwise obtain access to rights-of-way and the high capital expenditure needed to purchase a fleet, as well as track and equipment. Furthermore, the two railroads under consideration only compete with individual automobile traffic and serve to reduce congestion on roadways. One of the two entities, Hawkeye Express, transports passengers to a stadium from distant parking lots. The SNC provides passenger train service to tourist and other destinations between Sarasota Springs and North Creek, New York. FRA is not aware of any bus service that currently exists that competes with either of these railroads. Thus, while this final rule will have an economic impact on all passenger railroads, it will not have an impact on the competitive position of small railroads.

#### 4. Certification.

Pursuant to the RFA, FRA prepared and made available for public comment an initial regulatory flexibility analysis describing the impacts of the proposed rule on small entities (5 U.S.C. 603(a)). FRA did not receive any comments from small entities or comments regarding the economic impact on small entities. FRA does not expect the final rule to have a significant economic impact on a substantial number of small entities. Therefore, in lieu of preparing a final regulatory flexibility analysis, FRA will certify the final rule per section 605 of the RFA.

This final rule directly affects all railroads that provide intercity, or commuter or short-haul, passenger train service, of which there are currently 30 for purposes of this analysis (two intercity passenger railroads and 28 other railroads that provide passenger train service). FRA estimates that two of these railroads, or about 7 percent, are small entities. Therefore, this final rule will have an impact on a substantial number of small entities. FRA notes that these entities operate a small number of trains annually and employ a small number of crewmembers responsible for safe exterior side door operations.

However, FRA has determined that the economic impact on entities affected by the final rule will not be significant. The impact of the most burdensome requirement, to verify that by-pass devices are in the normal position and sealed, does not affect these entities because they do not run trains that use by-pass devices. The second most burdensome provision, requiring certain door safety features on new passenger cars and connected locomotives used in passenger service, will also not affect these entities as they are not expected to order new passenger equipment. In addition, the final rule allows additional time to meet these requirements. The other requirements of the final rule are about adopting and complying with safe door operating rules, and training crewmembers on these door operating rules. The impact of these operating rules will depend on the nature of a railroad's passenger operations. The two small entities have limited numbers of employees and train operations per year to which this rule will apply. Also, the final rule provides flexibility in meeting these requirements by giving railroads up to three years after the publication of the final rule to adopt and comply with these

operating rules and training requirements. Therefore, FRA believes that the economic impact of these operating rules and training requirements will be minimal. Accordingly, the Administrator of the FRA hereby certifies that this final rule will not have a significant economic impact on a substantial number of small entities.

C. Paperwork Reduction Act

FRA is submitting the information collection requirements in this final rule for review and approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). The sections that contain the new information and current information collection requirements and the estimated time to fulfill each requirement are as follows:

CFR Section	Respondent Universe	Total Annual Responses	Average Time Per Response	Total Annual Burden Hours
229.47 - Emergency brake valve – Marking brake pipe valve as such - DMU, MU, control cab locomotives – Marking emergency brake valve as such	30 railroads	30 markings	1 minute	1 hour
	30 railroads	5 markings	1 minute	.08 hour
238.7 - Waivers	30 railroads	5 waivers	2 hours	10 hours
238.15 - Movement of passenger equipment with power brake defect – Movement of passenger equipment – Defective en route – Conditional requirement – Notifications	30 railroads	1,000 tags	3 minutes	50 hours
	30 railroads	288 tags	3 minutes	14 hours
	30 railroads	144 notices	3 minutes	7 hours

238.17 - Limitations on movement of passenger equipment – Defects found at calendar day insp. & on movement of passenger equipment – Develops defects en route – Special requisites - Movement – Passenger equip. – Saf. appl. defect - Crew member notifications	30 railroads	200 tags	3 minutes	10 hours
	30 railroads	76 tags	3 minutes	4 hours
	30 railroads	38 radio notifications	30 seconds	.32 hour
238.21 - Petitions for special approval of alternative standards – Petitions for special approval of alternative compliance – Petitions for special approval of pre-revenue service acceptance testing plan - Comments on petitions	30 railroads	1 petition	16 hours	16 hours
	30 railroads	1 petition	120 hours	120 hours
	30 railroads	10 petitions	40 hours	400 hours
	Public/RR Industry	4 comments	1 hour	4 hours
238.103 - Fire safety - Procuring new pass. equipment – Fire safety analysis - Existing equipment – Final fire safety analysis - Transferring existing equipment – Revised fire safety analysis	2 new railroads	2 analyses	150 hours	300 hours
	30 railroads	1 analysis	40 hours	40 hours
	30 railroads/ APTA	3 analyses	20 hours	60 hours
238.107 - Inspection/testing/maintenance plans – Review by railroads	30 railroads	12 reviews	60 hours	720 hours
238.109 – Employee/contractor training - Training employees – Mechanical inspection  - Recordkeeping – Employee/ Contractor Current Qualifications	7,500 employees/ 100 trainers	2,500 empl./ 100 trainers	1.33 hours	3,458 hours
	30 railroads	2,500 records	3 minutes	125 hours
238.111 - Pre-revenue service acceptance testing plan: Passenger equipment that has previously been used in service in the U.S. - Passenger equipment that has not been previously used in revenue service in the U.S. - Subsequent equipment orders	9 equipment manufacturers	2 plans	16 hours	32 hours
	9 equipment manufacturers	2 plans	192 hours	384 hours
	9 equipment manufacturers	2 plans	60 hours	120 hours
238.131 –New passenger equipment w/exterior side doors – FMECA analysis for door safety system <b>(New Requirement)</b>	6 equipment manufacturers	3 FMECAs	4 hours	12 hours

238.133 – Exterior side door safety systems – Functional test plan <b>(New Requirement)</b> - Unsealed door bypass device – Crewmember notification to designated authority of unsealed door by-pass device - Train crew safety briefing after activation of door by-pass device - Train crew notification to designated authority - Qualified person (QP) or qualified mechanical person (QMP) determination that repairs cannot be made and that it is safe to move equipment - QP or QMP notification to train crew member in charge of train movement that door by-pass device has been activated - Train crew safety briefing - regarding their position on train - Record of door by-pass activation - Record of unintended door opening - Record of unsealed door by-pass devices as part of calendar day inspection	28 railroads	30 plans	4 hours	120 hours
	28 railroads	9,994 notifications	30 seconds	84 hours
	28 railroads	300 briefings	2 minutes	10 hours
	28 railroads	300 notices	30 seconds	3 hours
	28 railroads	300 decisions\ consults	5 minutes	25 hours
	28 railroads	300 notices	30 seconds	3 hours
	28 railroads	300 briefings	10 minutes	50 hours
	28 railroads	300 records	2 minutes	10 hours
	28 railroads	20 records	2 hours	40 hours
	28 railroads	20 records	4 hours	80 hours
238.135 – Operating practices for exterior side door safety systems <b>(New Requirements)</b> -- RR request for special approval from FRA to operate passenger train w/exterior side doors or trap doors, or both, open - FRA request to passenger RR for additional information regarding RR special request for approval - RR written operating rule on how to safely override a door summary circuit or no-motion system, or both - Copy of RR written operating rules to employees -RR employee training in this section’s requirements and how to identify/isolate malfunctioning exterior powered or manual side door - Training of new RR employees - Operational/efficiency tests of RR operating crewmembers and control center employees - RR operating rule requiring train crewmembers to determine status of their train’s exterior side doors	28 railroads	2 requests	25 hours	50 hours
	28 railroads	1 document	12 hours	12 hours
	28 railroads	10 operating rules	42 hours	420 hours
	28 railroads	10,000 copies	1 minute	167 hours
	28 railroads	3,383 tr. employees	30 minutes	1,692 hours
	5 new railroads	150 workers	30 minutes	75 hours
	28 railroads	3,383 tests	2 minutes	113 hours
	28 railroads	Included above under section 238.135(d)	Included above under sec. 238.135(d)	Included above under sec. 238.135(d)

238.137 – RR operating rule to provide for the safe use of equipment with incompatible exterior side door systems when used in a mixed consist ( <b>New Requirement</b> )	10 railroads	Included above under section 238.135(d)	Included above under section 238.135(d)	Included above under section 238.135(d)
238.213 – Corner posts – Plan to meet section’s corner post requirements for cab car or MU locomotives	30 railroads	10 plans	40 hours	400 hours
238.229 - Safety appliances - Welded safety appliances considered defective: lists - Lists identifying equip. w/welded safety appliances - Defective welded safety appliances – tags - Notification to crewmembers about non-compliant equipment - Inspection plans - Inspection personnel – training - Remedial action: defect/crack in weld – record - Petitions for special approval of alternative compliance – impractical equipment design - Records of inspection/repair of welded safety appliance brackets/supports/training	30 railroads 30 railroads 30 railroads 30 railroads 30 railroads 30 railroads 30 railroads 30 railroads 30 railroads	30 lists 30 lists 4 tags 2 notices 30 plans 60 workers 1 record 15 petitions 3,060 records	1 hour 1 hour 3 minutes 1 minute 16 hours 4 hours 2.25 hours 4 hours 12 minutes	30 hours 30 hours .20 hr. .0333 hr. 480 hours 240 hours 2 hours 60 hours 612 hours
238.230 - Safety appliances - New equipment - Inspection record of welded equipment by qualified employee - Welded safety appliances: Documentation for equipment impractically designed to mechanically fasten safety appliance support	30 railroads 30 railroads	100 records 15 document	6 minutes 4 hours	10 hours 60 hours
238.231 - Brake system - Inspection and repair of hand/parking brake: Records - Procedures verifying hold of hand/parking brakes	30 railroads 30 railroads	2,500 forms 30 procedures	21 minutes 2 hours	875 hours 60 hours
238.237 - Automated monitoring - Documentation for alerter/deadman control timing - Defective alerter/deadman control: Tagging	30 railroads 30 railroads	3 documents 25 tags	2 hours 3 minutes	6 hours 1 hour

238.303 - Exterior calendar day mechanical inspection of passenger equipment: Notice of previous inspection - Dynamic brakes not in operating mode: Tag - Conventional locomotives equipped with inoperative dynamic brakes: Tagging - MU passenger equipment found with inoperative/ineffective air compressors at exterior calendar day inspection: Documents - Written notice to train crew about inoperative/ineffective air compressors - Records of inoperative air compressors - Record of exterior calendar day mechanical inspection	30 railroads	25 notices	1 minute	1 hour
	30 railroads	50 tags	3 minutes	3 hours
	30 railroads	50 tags	3 minutes	3 hours
	30 railroads	4 documents	2 hours	8 hours
	30 railroads	100 notices	3 minutes	5 hours
	30 railroads	100 records	2 minutes	3 hours
	30 railroads	1,959,620 records	10 minutes + 1 minute	359,264 hours
238.305 - Interior calendar day mechanical inspection of passenger cars -Tagging of defective end/side doors -Records of interior calendar day inspection	30 railroads	540 tags	1 minute	9 hours
	30 railroads	1,968,980 records	5 minutes + 1 minute	196,898 hours
238.307 - Periodic mechanical inspection of passenger cars and unpowered vehicles - Alternative inspection intervals: Notifications - Notice of seats/seat attachments broken or loose - Records of each periodic mechanical inspection - Detailed documentation of reliability assessments as basis for alternative inspection interval	30 railroads	2 notices/ notifications	5 hours	10 hours
	30 railroads	200 notices	2 minutes	7 hours
	30 railroads	19,284 records	200 hours/ 2 minutes	3,857,443 hours
	30 railroads	5 documents	100 hours	500 hours
238.311 - Single car test - Tagging to indicate need for single car test	30 railroads	50 tags	3 minutes	3 hours
238.313 - Class I brake test - Record for additional inspection for passenger equipment that does not comply with § 238.231(b)(1)	30 railroads	15,600 records	30 minutes	7,800 hours
238.315 - Class IA brake test - Notice to train crew that test has been performed (verbal notice) - Communicating signal tested and operating	30 railroads	18,250 notices	5 seconds	25 hours
	30 railroads	365,000 tests	15 seconds	1,521 hours

238.317 - Class II brake test - Communicating signal tested and operating	30 railroads	365,000 tests	15 seconds	1,521 hours
238.321 - Out-of-service credit - Passenger car: Out-of-use notation	30 railroads	1,250 notes	2 minutes	42 hours
238.445 - Automated monitoring - Performance monitoring: alerters/alarms - Monitoring system: Self-test feature: Notifications	1 railroad  1 railroad	10,000 alerts  21,900 notices	10 seconds  20 seconds	28 hours  122 hours
238.503 - Inspection, testing, and maintenance requirements – Plans 238.505 - Program approval procedures - Submission of program/plans and comments on programs	1 railroad  Rail Industry	1 plan  3 comments	1,200 hours  3 hours	1,200 hours  9 hours

All estimates include the time for reviewing instructions; searching existing data sources; gathering or maintaining the needed data; and reviewing the information. For information or a copy of the paperwork package submitted to OMB, contact Mr. Robert Brogan, Information Clearance Officer, Office of Railroad Safety, FRA, at 202-493-6292, or Ms. Kimberly Toone, Records Management Officer, Office of Information Technology, FRA, at 202-493-6132, or via e-mail at the following addresses: Robert.Brogan@dot.gov; Kim.Toone@dot.gov.

Organizations and individuals desiring to submit comments on the collection of information requirements should send them directly to the Office of Management and Budget, Office of Information and Regulatory Affairs, Washington, D. C. 20503, Attention: FRA Desk Officer. Comments may also be sent via e-mail to the Office of Management and Budget at the following address: oira\_submissions@omb.eop.gov

OMB is required to make a decision concerning the collection of information requirements contained in this final rule between 30 and 60 days after publication of this

document in the Federal Register. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication.

FRA cannot impose a penalty on persons for violating information collection requirements which do not display a current OMB control number, if required. FRA intends to obtain current OMB control numbers for new information collection requirements resulting from this rulemaking action prior to the effective date of this final rule. The OMB control number, when assigned, will be announced by separate notice in the Federal Register.

D. Federalism Implications

Executive Order 13132, “Federalism” (64 FR 43255, Aug. 10, 1999), requires FRA to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.” “Policies that have federalism implications” are defined in the Executive Order to include regulations that have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.” Under Executive Order 13132, an agency may not issue a regulation with federalism implications that imposes substantial direct compliance costs 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 government officials early in the process of developing the regulation. Where a regulation has federalism implications and preempts State law, the agency seeks to

consult with State and local officials in the process of developing the regulation.

FRA has analyzed this final rule under the principles and criteria in Executive Order 13132. This final rule will not have a substantial effect on States or their political subdivisions, and it will not affect the relationships between the Federal government and States or their political subdivisions, or the distribution of power and responsibilities among the various levels of government. In addition, FRA determined this regulatory action will not impose substantial direct compliance costs on States or their political subdivisions. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply.

However, this final rule could have preemptive effect by operation of law under certain provisions of the Federal railroad safety statutes, specifically the former Federal Railroad Safety Act of 1970, repealed and recodified at 49 U.S.C. 20106, and the former Locomotive Boiler Inspection Act (LIA) at 45 U.S.C. 22-34, repealed and re-codified at 49 U.S.C. 20701-20703. Section 20106 provides that States may not adopt or continue in effect any law, regulation, or order related to railroad safety or security that covers the subject matter of a regulation prescribed or order issued by the Secretary of Transportation (with respect to railroad safety matters) or the Secretary of Homeland Security (with respect to railroad security matters), except when the State law, regulation, or order qualifies under the “essentially local safety or security hazard” exception to section 20106. Moreover, the Supreme Court has interpreted the former LIA to preempt the field of locomotive safety. See Napier v. Atlantic Coast Line R.R., 272 U.S. 605 (1926).

E. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Public Law 96-39, 19 U.S.C. 2501 et seq.) prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

FRA has assessed the potential effect of this rulemaking on foreign commerce and believes that its requirements are consistent with the Trade Agreements Act. The requirements are safety standards, which, as noted, are not considered unnecessary obstacles to trade. Moreover, FRA has sought, to the extent practicable, to state the requirements in terms of the performance desired, rather than in more narrow terms restricted to a particular design or system.

F. Environmental Impact

FRA has evaluated this final rule under the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.), other environmental statutes, related regulatory requirements, and its “Procedures for Considering Environmental Impacts” (FRA’s Procedures) (64 FR 28545, May 26, 1999). FRA has determined this final rule is categorically excluded from detailed environmental review under section 4(c)(20) of FRA’s NEPA Procedures, “Promulgation of railroad safety rules and policy statements that do not result in significantly increased emissions of air or water pollutants or noise or increased traffic congestion in any mode of transportation.” See 64 FR 28547, May 26,

1999. Categorical exclusions (CEs) are actions identified in an agency's NEPA implementing procedures that do not normally have a significant impact on the environment and therefore do not require either an environmental assessment (EA) or environmental impact statement (EIS). See 40 CFR 1508.4.

In analyzing the applicability of a CE, the agency must also consider whether extraordinary circumstances are present that would warrant a more detailed environmental review through the preparation of an EA or EIS. Id. Under section 4(c) and (e) of FRA's Procedures, FRA has further concluded that no extraordinary circumstances exist with respect to this regulation that might trigger the need for a more detailed environmental review. The purpose of this rulemaking is to develop and install safer door operating mechanisms and procedures including testing and notification requirements. FRA does not anticipate any environmental impacts from these requirements and finds that there are no extraordinary circumstances present in connection with this final rule.

G. Executive Order 12898 (Environmental Justice)

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and DOT Order 5610.2(a) (91 FR 27534, May 10, 2012) require DOT agencies to achieve environmental justice as part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including interrelated social and economic effects, of their programs, policies, and activities on minority populations and low-income populations. The DOT Order instructs DOT agencies to address compliance

with Executive Order 12898 and requirements within the DOT Order in rulemaking activities, as appropriate. FRA has evaluated this final rule under Executive Order 12898 and the DOT Order and determined it will not cause disproportionately high and adverse human health and environmental effects on minority populations or low-income populations.

H. Executive Order 13175 (Tribal Consultation)

FRA has evaluated this final rule under the principles and criteria contained in Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, dated November 6, 2000. This final rule will not have a substantial direct effect on one or more Indian tribes, will not impose substantial direct compliance costs on Indian tribal governments, and will not preempt tribal laws. Therefore, the funding and consultation requirements of Executive Order 13175 do not apply, and a tribal summary impact statement is not required.

I. Unfunded Mandates Reform Act of 1995

Under section 201 of the Unfunded Mandates Reform Act of 1995 (Public Law 104-4, 2 U.S.C. 1531), 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).” Section 202 of the Act (2 U.S.C. 1532) further requires that “before promulgating any general notice of proposed rulemaking that is likely to result in the promulgation of any rule that includes any Federal mandate that may result in 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. When adjusted for inflation using the Consumer Price Index for All Urban Consumers as published by the Bureau of Labor Statistics, the equivalent value of \$100,000,000 in year 2014 dollars is \$155,000,000.<sup>7</sup> This final rule will not result in the expenditure, in the aggregate, of \$155,000,000 or more in any one year, and thus preparation of such a statement is not required.

J. Energy Impact

Executive Order 13211 requires Federal agencies to prepare a Statement of Energy Effects for any “significant energy action.” See 66 FR 28355, May 22, 2001. Under the Executive Order, a “significant energy action” is defined as any action by an agency (normally published in the Federal Register) 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

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<sup>7</sup> See DOT guidance “2015 Threshold of Significant Regulatory Actions Under the Unfunded Mandates Reform Act of 1995,” May 6, 2015 (update), available electronically at <http://www.transportation.gov/office-policy/transportation-policy/2015-threshold-significant-regulatory-actions-under-unfunded>.

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 final rule under Executive Order 13211. FRA determined this final rule is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Consequently, FRA has determined that this regulatory action is not a “significant energy action” within the meaning of the Executive Order.

K. Privacy Act

Consistent with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its rulemaking process. DOT posts these comments, without edit, including any personal information the commenter provides, to [www.regulations.gov](http://www.regulations.gov), as described in the system of records notice (DOT/ALL-14 FDMS), which can be reviewed at [www.dot.gov/privacy](http://www.dot.gov/privacy).

L. Analysis under 1 CFR part 51

As required by 1 CFR 51.5, FRA has summarized the standard incorporated by reference and shown its reasonable availability in the section-by-section analysis of this rulemaking document.

**List of Subjects in 49 CFR Part 238**

Incorporation by reference, Passenger equipment, Railroad safety, Reporting and recordkeeping requirements.

**The Rule**

For the reasons discussed in the preamble, FRA amends part 238 of chapter II, subtitle B of title 49, Code of Federal Regulations as follows:

**PART 238—[AMENDED]**

1. The authority citation for part 238 continues 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 1.89.

**Subpart A—General**

2. Section 238.5 is amended by adding in alphabetical order definitions of “By-pass”, “Door isolation lock”, “Door summary circuit”, “End-of-train circuit”, “Exterior side door safety system”, “No-motion system”, and “Trainline door circuit” to read as follows:

**§ 238.5            Definitions.**

\*       \*       \*       \*       \*

By-pass means a device designed to override a function.

\*       \*       \*       \*       \*

Door isolation lock means a cutout/lockout mechanism installed at each exterior side door panel to secure a door in the closed and latched position, provide a door-closed indication to the summary circuit, and remove power from the door motor or door motor controls.

Door summary circuit means a trainline door circuit that provides an indication to the controlling cab of the train that all exterior side doors are closed as intended, or locked out with a door isolation lock, or both.

\*       \*       \*       \*       \*

End-of-train circuit means a feature typically used to determine the physical end

of the train, or the last passenger car in the train, or both, for the door summary circuit.

\* \* \* \* \*

Exterior side door safety system means a system of safety features that enable the safe operation of the exterior side doors of a passenger car or train. The exterior side door safety system includes appurtenances and components that control, operate, and display the status of the exterior side doors, and is interlocked with the train's traction power control.

\* \* \* \* \*

No-motion system means a system on a train that detects the motion of the train.

\* \* \* \* \*

Trainline door circuit means a circuit used to convey door signals over the length of a train.

\* \* \* \* \*

### **Subpart B—Safety Planning and General Requirements**

3. Section 238.131 is added to subpart B read as follows:

**§ 238.131 Exterior side door safety systems—new passenger cars and locomotives used in passenger service.**

(a) Safety systems for powered exterior side doors. All powered exterior side door safety systems in passenger cars, and connected door safety systems in locomotives used in passenger service, that are ordered on or after April 5, 2016, or placed in service for the first time on or after February 5, 2018, shall:

(1) Be built in accordance with APTA standard PR-M-S-18-10, “Standard for Powered Exterior Side Door System Design for New Passenger Cars,” approved February 11, 2011. In particular, locomotives used in passenger service shall be connected or interlocked with the door summary circuit to prohibit the train from developing tractive power if an exterior side door in a passenger car is not closed, unless the door is under the direct physical control of a crewmember for his or her exclusive use. The incorporation by reference of this APTA standard was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of the incorporated document from the American Public Transportation Association, 1666 K Street, NW, Suite 1100, Washington, DC 20006 (telephone 202-496-4800; [www.apta.com](http://www.apta.com)). You may inspect a copy of the document at the Federal Railroad Administration, Docket Clerk, 1200 New Jersey Avenue, SE, Washington, DC or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html) ;

(2) Be designed based on a Failure Modes, Effects, Criticality Analysis (FMECA);

(3) Contain an obstruction detection system sufficient to detect and react to both small and large obstructions and allow the obstruction to be released when detected;

(4) Be designed so that activation of a door by-pass feature does not affect the operation of the obstruction detection system;

(5) Require a door control panel key or other secure device to activate a door control panel;

(6) Not be operated from a door control panel when the door control panel key or other secure device is removed; and

(7) Not be affected by the movement or position of the locomotive throttle. A train's throttle position shall neither open nor close the exterior side doors on the train.

(b) Safety system for manual and powered exterior side doors. All manual and powered exterior side door systems in passenger cars, and connected door safety systems in locomotives used in passenger service, that are ordered on or after April 5, 2016, or placed in service for the first time on or after February 5, 2018 shall be:

(1) Designed with a door summary circuit and so connected or interlocked as to prohibit the train from developing tractive power if an exterior side door in a passenger car is not closed, unless the door is under the direct physical control of a crewmember for his or her exclusive use;

(2) Connected to interior and exterior side door status indicators;

(3) Connected to a door summary status indicator that is readily viewable to the engineer from his or her normal position in the operating cab; and

(4) If equipped with a door by-pass device, designed so that the by-pass device functions only when activated from the operating cab of the train.

(c) Additional requirements. In addition to the requirements of this section, requirements related to exterior side door safety on passenger trains are provided in §§ 238.112, 238.133, 238.135, 238.137, and 238.439.

4. Section 238.133 is added to subpart B to read as follows:

**§ 238.133 Exterior side door safety systems—all passenger cars and locomotives used in a passenger service.**

(a) By-pass device verification—(1) Visual inspection. Except as provided in paragraphs (a)(2) and (3) of this section, a member of the crew of each passenger train must verify by observation that all door by-pass devices that can affect the safe operation of the train are sealed in the normal (non-by-pass) position when taking control of the train.

(2) Functional test. Instead of a visual inspection of the door by-pass devices, the railroad may develop a plan to perform a functional test to determine that the door summary status indicator is functioning as intended. The functional test plan shall be made available for inspection by FRA.

(3) Face-to-face relief. Crewmembers taking control of a train do not need to perform either a visual inspection or a functional test of the door by-pass devices in cases of face-to-face relief of another train crew and notification by that crew as to the functioning of the door by-pass devices.

(b) Unsealed door by-pass device. A crewmember must notify the railroad's designated authority pursuant to the railroad's defect reporting system if a door by-pass device that could affect the safe operation of the train is found unsealed during the train's daily operation. If the train crew can test the door safety system and determine that the door summary status indicator is functioning as intended, the train may travel in service until the next forward repair point where a seal can be applied by a qualified maintenance

person (QMP) or until its next calendar day inspection, whichever occurs first; if not, the train crew must follow the procedures outlined in paragraph (c) of this section.

(c) En route failure. If it becomes necessary to activate a door by-pass device, the train may continue to its destination terminal, provided that the train crew conducts a safety briefing that includes a description of the location(s) where crewmembers will position themselves on the train in order to observe the boarding and alighting of passengers, notifies the railroad's designated authority that the train's door by-pass device has been activated, and adheres to the operating rules required by § 238.135. After the train has reached its destination terminal, the train may continue in passenger service until its arrival at the next forward repair point or its next calendar day inspection, whichever occurs first, provided that prior to movement of equipment with a door by-pass device activated:

(1) An on-site QMP shall determine that repairs cannot be made at the time and it is safe to move the equipment in passenger service. If a QMP is not available on site, these determinations may be made based upon a description of the condition provided by an on-site qualified person (QP) to a QMP offsite; and

(2) The QP or QMP shall notify the crewmember in charge of the movement of the train that the door by-pass device has been activated. The train crew must then hold a safety briefing that includes information such as the locations where each crewmember will position himself or herself on the train to ensure that passengers board and alight from the train safely.

(d) Records. The railroad shall maintain a record of each door by-pass

activation and each unintended opening of a powered exterior side door, including any repair(s) made, in the defect tracking system as required by § 238.19.

(e) Door control panels. Exterior side doors shall not be capable of operation from a door control panel when the key or other similar device is removed.

(f) End-of-train circuit. End-of-train circuit integrity shall be maintained. When switches are used to establish the end-of-train circuit, the switches shall be secured in a manner to prevent access by unauthorized personnel.

(g) Exterior side door safety system override devices. (1) Exterior side door safety system override devices that can adversely affect the train's door safety system must be inactive and sealed in all passenger cars and locomotives in the train consist, including cab cars and MU locomotives, if they are so equipped.

(2) As part of the equipment's calendar day inspection, all exterior side door safety system override devices must be inactive and sealed in all passenger cars and all locomotives in the train consist, including cab cars and MU locomotives, if they are so equipped.

5. Section 238.135 is added to subpart B to read as follows:

**§ 238.135** **Operating practices for exterior side door safety systems.**

(a) At the beginning of his or her duty assignment prior to the train's departure, each crewmember must participate in a safety briefing that identifies each crewmember's responsibilities relating to the safe operation of the train's exterior side doors, including responsibilities for the safe operation of the exterior side doors when arriving at or departing a station.

(b) After April 5, 2016, all passenger train exterior side doors and trap doors must be closed when a train is in motion between stations except when:

(1) The train is departing or arriving at a station if:

(i) A crewmember needs to observe the station platform; and

(ii) The open door is attended by the crewmember; or

(2) A crewmember must perform on-ground functions, such as, but not limited to, lining switches, making up or splitting the train, providing crossing protection, or inspecting the train.

(c)(1) Except as provided in paragraph (b) of this section, passenger railroads must receive special approval from FRA's Associate Administrator for Railroad Safety/Chief Safety Officer to operate passenger trains with exterior side doors or trap doors, or both, open between stations.

(2) Any request for special approval must include:

(i) A written justification explaining the need to operate a passenger train with its exterior side doors or trap doors, or both, open between stations; and

(ii) A detailed hazard analysis, including a description of specific measures to mitigate any added risk.

(3) The request must be signed by the chief executive officer (CEO), or equivalent, of the organization(s) making the request.

(4) FRA may request that the passenger railroad submit additional information to support its request before FRA approves the request.

(d) No later than December 6, 2018, each railroad shall adopt and comply

with operating rules on how to safely override a door summary circuit or no-motion system, or both, in the event of an en route exterior side door failure or malfunction on a passenger train. Railroads shall provide these written rules to their crewmembers and control center personnel and make them available for inspection by FRA. These written rules shall include:

(1) Instructions to crewmembers and control center personnel, describing what conditions must be present in order to override the door summary circuit or no-motion system, or both; and

(2) Steps crewmembers and control center personnel must take after the door summary circuit or no-motion system, or both, have been overridden to help provide for continued passenger safety.

(e) No later than December 6, 2018, each passenger train crewmember must be trained on:

(1) The requirements of this section; and

(2) How to identify and isolate equipment with a malfunctioning exterior powered or manual side door.

(f) No later than December 6, 2018, each railroad shall adopt and comply with operating rules requiring train crewmembers to determine the status of their train's exterior side doors so that their train may safely depart a station. These rules shall require crewmembers to determine that there are no obstructions in their train's exterior side doors before the train departs.

(g) Beginning December 6, 2018, each railroad shall periodically conduct

operational (efficiency) tests and observations of its operating crewmembers and control center personnel as appropriate to their roles, to determine each individual's knowledge of the railroad's powered and manual exterior side door safety procedures for its passenger trains.

6. Section 238.137 is added to subpart B to read as follows:

**§ 238.137**     **Mixed consist; operating equipment with incompatible exterior side door systems.**

(a) A train made up of equipment with incompatible exterior side door systems shall be operated within the constraints of each such door system.

(b) No later than December 6, 2018, each railroad shall adopt and comply with operating rules to provide for the safe use of equipment with incompatible exterior side door systems when utilized in a mixed consist.

7. Appendix A to part 238 is amended by adding entries for §§ 238.131, 238.133, 238.135, and 238.137 in numerical order under subpart B to read as follows:

**Appendix A to Part 238—Schedule of Civil Penalties<sup>1,2</sup>**

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<sup>1</sup> A penalty may be assessed against an individual only for a willful violation. Generally when two or more violations of these regulations are discovered with respect to a single unit of passenger equipment that is placed or continued in service by a railroad, the appropriate penalties set forth above are aggregated up to a maximum of \$16,000 per day. However, failure to perform, with respect to a particular unit of passenger equipment, any of the inspections and tests required under subparts D and F of this part will be treated as a violation separate and distinct from, and in addition to, any substantive violative conditions found on that unit of passenger equipment. Moreover, the Administrator reserves the right to assess a penalty of up to \$105,000 for any violation where circumstances warrant. See 49 CFR part 209, appendix A.

Failure to observe any condition for movement of defective equipment set forth in § 238.17 will deprive the railroad of the benefit of the movement-for-repair provision and make the railroad and any

Section	Violation	Willful Violation
* * * * *		

**SUBPART B—SAFETY PLANNING AND GENERAL REQUIREMENTS**

\* \* \* \* \*

238.131 Exterior side door safety systems—new passenger cars and locomotives used in passenger service.....	10,000	15,000
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238.133 Exterior side door safety systems—all  
passenger cars and locomotives used in a passenger  
service:

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responsible individuals liable for penalty under the particular regulatory section(s) concerning the substantive defect(s) present on the unit of passenger equipment at the time of movement.

Failure to observe any condition for the movement of passenger equipment containing defective safety appliances, other than power brakes, set forth in § 238.17(e) will deprive the railroad of the movement-for-repair provision and make the railroad and any responsible individuals liable for penalty under the particular regulatory section(s) contained in part 231 of this chapter or § 238.429 concerning the substantive defective condition.

The penalties listed for failure to perform the exterior and interior mechanical inspections and tests required under § 238.303 and § 238.305 may be assessed for each unit of passenger equipment contained in a train that is not properly inspected. Whereas, the penalties listed for failure to perform the brake inspections and tests under § 238.313 through § 238.319 may be assessed for each train that is not properly inspected.

<sup>2</sup> The penalty schedule uses section numbers from 49 CFR part 238. If more than one item is listed as a type of violation of a given section, each item is also designated by a “penalty code,” which is used to facilitate assessment of civil penalties, and which may or may not correspond to any subsection designation(s). For convenience, penalty citations will cite the CFR section and the penalty code, if any. FRA reserves the right, should litigation become necessary, to substitute in its complaint the CFR citation in place of the combined CFR and penalty code citation, should they differ.

(a)(1) Failure to verify position of by-pass device or by-pass device not sealed.....	2,500	5,000
(a)(2) Failure to provide functional test plan.....	5,000	7,500
(a)(3) Failure to perform visual inspection or functional test.....	2,500	5,000
(b) Unsealed door by-pass device:		
(b)(1) Door by-pass device not inactive, sealed, or seal ineffective.....	2,500	5,000
(b)(2) Failure to notify designated authority.....	5,000	7,500
(b)(3) Movement beyond repair point.....	7,500	11,000
(b)(4) Door by-pass device not sealed by QMP at calendar day inspection.....	2,500	5,000
(c)(1) Failure to follow en route by-pass activation procedures; improper movement of defective equipment.....	7,500	11,000
(c)(2) Failure to use QMP.....	5,000	7,500
(d) Failure to maintain record.....	2,000	4,000
(e) Door control panel not inactive when the key or other similar device is removed.....	5,000	7,500
(f) End-of-train circuit:		
(f)(1) End-of-train circuit integrity not maintained.....	5,000	7,500

(f)(2) Switches not secured to prevent unauthorized access.....	2,500	5,000
(g) Door by-pass device not inactive, sealed or seal ineffective.....	2,500	5,000
238.135 Operating practices for exterior side door safety systems:		
(a) Failure to conduct proper safety briefing.....	7,500	11,000
(b)(1) Exterior side doors and trap doors not closed when a train is in motion between stations.....	10,000	15,000
(b)(2) Failure to follow conditions for operating a train while in motion between stations with an exterior side door or trap door open.....	10,000	15,000
(d) Failure to adopt and comply with operating rules on how to safely override a door summary circuit or no-motion system.....	9,500	13,000
(e) Failure to provide training.....	9,500	13,000
(f) Failure to adopt and comply with operating rules requiring crewmembers to determine the status of the train's exterior side doors.....	9,500	13,000
(g) Failure to periodically conduct operational (efficiency) tests and observations.....	9,500	13,000
238.137 Mixed consist; operating equipment with		

incompatible exterior side door systems:

(a) Incompatible exterior side door systems

not operated within the constraints of each door

safety system..... 5,000 7,500

(b) Failure to adopt and comply with

operating rules to provide for the safe use of

equipment with incompatible exterior side door

systems when utilized in a mixed consist..... 9,500 13,000

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Issued in Washington, DC, on November 25, 2015.

Sarah Feinberg,  
Administrator.

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