

**DEPARTMENT OF TRANSPORTATION**

**Federal Railroad Administration**

**49 CFR Part 218**

**[Docket No. FRA-2014-0033, Notice No. 1]**

**RIN 2130-AC48**

**Train Crew Staffing**

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

**ACTION:** Notice of proposed rulemaking (NPRM).

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**SUMMARY:** FRA proposes regulations establishing minimum requirements for the size of train crew staffs depending on the type of operation. A minimum requirement of two crewmembers is proposed for all railroad operations, with exceptions proposed for those operations that FRA believes do not pose significant safety risks to railroad employees, the general public, and the environment by using fewer than two-person crews. This proposed rule would also establish minimum requirements for the roles and responsibilities of the second train crewmember on a moving train, and promote safe and effective teamwork. Additionally, FRA co-proposes two different options for situations where a railroad wants to continue an existing operation with a one-person train crew or start up an operation with less than two crewmembers. Under both co-proposal options, a railroad that wants to continue an existing operation or start a new operation with less than a two-person train crew would be required to describe the operation and provide

safety-related information to FRA; however, proposed Option 1 includes an FRA review and approval period lasting up to 90 days while Option 2 proposes permitting such operations to initiate or continue without a mandatory FRA review and approval waiting period or while such review is taking place. For start-up freight operations with less than two crewmembers, proposed Option 2 also requires a statement signed by the railroad officer in charge of the operation certifying a safety hazard analysis of the operation has been completed and that the operation provides an appropriate level of safety.

**DATES:** (1) Written Comments: Written comments on the proposed rule must be received by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Comments received after that date will be considered to the extent possible without incurring additional expense or delay.

(2) FRA anticipates being able to resolve this rulemaking without a public, oral hearing. However, if FRA receives a specific request for a public, oral hearing prior to **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, one will be scheduled and FRA will publish a supplemental notice in the Federal Register to inform interested parties of the date, time, and location of any such hearing.

**ADDRESSES:** You may submit comments identified by the docket number FRA-2014-0033 by any of the following methods:

- Online: Comments should be filed at the Federal eRulemaking Portal, <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue SE., W12-140, Washington, DC 20590.
- Hand Delivery: Room W12-140 on the Ground level of the West Building, 1200 New Jersey Avenue SE., Washington, DC 20590 between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays.

**Instructions:** All submissions must include the agency name, docket name and docket number or Regulatory Identification Number (RIN) for this rulemaking (RIN 2130-AC48). 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 related to any submitted petitions or materials.

Docket: For access to the docket to read background documents or comments received, go to <http://www.regulations.gov> at any time or to the U.S. Department of Transportation, Docket Operations, M-30, West Building, Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays.

**FOR FURTHER INFORMATION CONTACT:** Joseph D. Riley, Railroad Safety Specialist (OP)-Operating Crew Certification, U.S. Department of Transportation, Federal Railroad Administration, Mail Stop-25, Room W33-412, 1200 New Jersey Avenue, SE., Washington, DC 20590, (202) 493-6318, or Alan H. Nagler, Senior Trial Attorney, U.S. Department of Transportation, Federal Railroad Administration, Office of Chief Counsel, RCC-10, Mail Stop 10, West Building 3rd Floor, Room W31-309, 1200

New Jersey Avenue, SE., Washington, DC 20590, (202) 493-6038).

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## I. Executive Summary

### **Purpose of the Regulatory Action and Legal Authority**

FRA is concerned that as railroads implement positive train control (PTC) and other technologies, they may expand use of less than two-person crews on operations without considering safety risks or implementing risk mitigating actions that FRA believes are necessary. Because there are currently few railroad operations that utilize a one-person crew and FRA has not been specifically tracking the safety of those operations through its recordkeeping and reporting requirements, FRA cannot provide

reliable or conclusive statistical data to suggest whether one-person crew operations are generally safer or less safe than multiple-person crew operations. FRA does not currently collect sufficient data related to the size of a train crew nor do accident reports and investigations generally address the size of a crew in order for FRA or any entity to definitively compare one-person operations to multiple person operations. However, FRA has studies showing the benefits of a second crewmember and other information detailing the potential safety benefits of multiple-person crews. A recent catastrophic accident in Canada occurred in which a one-person crew did not properly secure an unattended train and another accident occurred in which a multiple-person crew was able to effectively respond to an accident and remove cars from danger. In addition, qualitative studies show that one-person train operations pose increased risks by potentially overloading the sole crewmember with tasks, and that PTC does not substitute for all the tasks performed by properly trained conductors. Task overload can lead to a loss of situational awareness, and potentially to accidents. Moreover, other nations require government approval of railroad decisions to use less than two-person crews. Further, even if FRA does not have data to prove a direct correlation between higher rates of safety and multiple person crews, it is true that railroads have achieved a continually improving safety record during a period in which the industry largely employed two-person train crews.

Persons in the railroad industry have pointed to countervailing effects of a requirement to have more than one crewmember on a train, such as additional incidents caused by crew distraction. In addition, having a second crew person on board a train

may not prevent or mitigate an incident but could add to the number of persons killed or seriously injured when one occurs. FRA believes such instances are very rare, but does not have readily available information for estimating such potential countervailing impacts of this proposed rule. FRA believes that having a properly trained second crew person on board, or implementing risk mitigating actions that FRA believes are necessary to address any additional safety risks from using fewer than two-person crews, provides net safety benefits relative to using fewer than two-person crews or not implementing mitigating measures that FRA believes are necessary.

In discussing the future of train operations with officials from various railroads, FRA has become aware that some railroads have shown a willingness to conduct more operations with only one crewmember. FRA has existing authority to take emergency action to prohibit an unsafe operation if the agency is aware of it (49 U.S.C. 20104), but FRA often lacks information to use this authority to address unsafe one-person crews. FRA does not currently have a mechanism to collect detailed information about railroad one-person train operations to determine railroad safety risk. Furthermore, FRA believes it would be inappropriate to wait until an emergency situation arises before it takes action against a one-person operation that is not providing an appropriate level of safety. FRA believes this proposed rule is necessary for FRA to protect railroad employees, the general public, and the environment by considering the safety risks of each type of operation and prohibiting operations that pose an unacceptable level of risk as compared to operations utilizing a two-person crew. This rulemaking is also necessary to ensure that the public, through FRA, has a voice in the railroad's decision to utilize less than a



two-person crew.

FRA research demonstrates the effectiveness of properly trained teams. It is not the act of adding a second person that makes the train safer, but instead it is the act of adding a properly qualified person, who understands the roles of all the crewmembers, and who has the experience or ability to relieve the locomotive engineer of some of the mental strain that can contribute to accidents attributed to human factor errors. FRA understands that expert teamwork can be achieved through effective coordination, cooperation, and communication. However, FRA estimates both options of the proposal would have a small impact on teamwork because FRA expects that either co-proposal option would result in no more than the labor hour equivalent of two to three additional crewmembers nationwide annually relative to what would occur with existing operations with less than two crewmembers if the rule were not in place and because FRA believes that all railroads with multiple-person crews are operating in compliance with the proposal's requirements for the roles and responsibilities of a second crewmember. FRA expects that under the first co-proposal it would require some start-up one-person crew operations (but not existing one-person crew operations) to implement risk mitigating measures that FRA believes are necessary to address safety risks of using one-person crews in specific operating environments. However, FRA expects to require such measures in very few circumstances, and estimates a cost range of \$5.1 million to \$27.7 million over 10 years and discounted at 7 percent from implementing such measures under either co-proposal option.

The proposed rulemaking would be expected to grant an exception to most

existing operations with less than two crewmembers. However, some operations would still not be able to meet the requirements of the proposed exceptions and those railroads would have to add one person to their train crews. FRA estimates that about 10,361 train starts would not be eligible for the proposed specific freight train exception §218.131. Furthermore, FRA estimated that around 15,185 train starts would not be covered by the exception for existing one-person operations in § 218.133. Given the proposed structure of the passenger train exceptions in § 218.129, FRA does not expect any passenger railroad to have to add a crewmember to an existing train operation as a result of the NPRM. Freight railroads would be expected to take full advantage of the special approval procedure in § 218.135. FRA used a range of values to estimate the costs that would be related to § 218.135 due to the uncertainty in the future of crew staffing. This range stipulates that between 850,266 and 15,675,000 train starts would be affected by crew reduction over the next 10 years and enter the special approval procedure as proposed in § 218.135. For passenger railroads, the proposed special approval procedure would maintain the status quo, as any railroad that could potentially request special approval under § 218.135 would have done it through a passenger train emergency preparedness plan under part 239.

FRA is proposing regulations concerning train crew staffing based on the statutory general authority of the Secretary of Transportation (Secretary). The general authority states, in relevant part, that the Secretary “as necessary, shall prescribe regulations and issue orders for every area of railroad safety supplementing laws and regulations in effect on October 16, 1970.” 49 U.S.C. 20103. The Secretary delegated

this authority to the Federal Railroad Administrator. 49 CFR 1.89(a).

### **Summary of the Major Provisions of the Regulatory Action in Question**

FRA is co-proposing regulations to address train crew sizes. FRA's first co-proposal would establish minimum requirements for the size of different train crew staffs depending on the type of operation and the safety risks posed by the operation to railroad employees and the general public. This proposal also prescribes minimum requirements for the appropriate roles and responsibilities of train crewmembers on a moving train, and promotes safe and effective teamwork. Each railroad may prescribe additional or more stringent requirements in its operating rules, timetables, timetable special instructions, and other instructions.

FRA's first proposed approach starts with a general requirement that each train shall be assigned a minimum of two crewmembers, regardless of whether the train is a freight or passenger operation. The NPRM contains several proposed requirements detailing the roles and responsibilities of the second crewmember when the train is moving. The primary role of a second crewmember, typically a conductor, is to have the ability to directly communicate with the crewmember in the cab of the controlling locomotive, i.e., the locomotive engineer, even if the second crewmember is located outside of the operating cab.

Several of the proposed sections contain exceptions to this general requirement, specifying when a train would not require a minimum of two crewmembers. These are generally low risk operations that are not hauling large quantities of hazardous materials, traveling at high speeds, or putting passengers on passenger trains at risk. Among other

exceptions, there is a proposed exception for a tourist, scenic, historic, or excursion operation that is not part of the general railroad system of transportation. Other exceptions allow railroads to use one-person crews to assist other trains (i.e., helper service), maintain track, or move locomotives where they are needed without being burdened by the proposed two crewmember minimum staffing requirement.

Two of the proposed sections suggest how a railroad could apply for FRA approval to operate one-person train crews. One of those proposed sections would require a railroad to provide information describing an operation that existed prior to January 1, 2015, and FRA would have 90 days from the day of receipt of the submission to issue written notification of approval or disapproval. The railroad would be allowed to continue the operation unless FRA notifies the railroad it must cease the operation and provides the reason(s) for the decision. If FRA failed to disapprove the proposal within 90 days of the submission, the railroad would be permitted to go forward with its plan. The second of the proposed sections under the first co-proposal would allow any railroad, at any time, to provide information describing an operation and petition FRA for special approval of a train operation with less than two crewmembers. FRA would normally grant or deny the petition within 90 days of receipt, but could attach special conditions to the approval of any petition after considering the benefits and costs of the condition(s).

Under the second co-proposal, an existing one-person train operation would be required to provide information to FRA in order to continue the operation, and a start-up train operation with less than two crewmembers would be required to provide information to FRA before initiating the operation. The railroad with the start-up

operation would also be required to attest that it has studied the operating environment and circumstances of the intended operation and that the railroad believes that it has taken any precautions necessary to ensure that the proposed single-person operation will not pose significant safety risks to railroad employees, the general public, and the environment. Under this co-proposal, the railroad would not be required to wait for FRA approval prior to beginning single-person service. With the railroad's notice and attestation the railroad would be permitted to operate a single-person service. Both existing and start-up train operations with less than two crewmembers would be required to provide an appropriate level of safety. However, FRA reserves the right to investigate an operation and halt or add conditions to an operation's continuance if FRA determines that an operation is not providing an appropriate level of safety.

### **Costs and Benefits**

FRA estimated the benefit and cost ranges of the two co-proposals using a 10-year time horizon, and performed sensitivity analysis using a 20-year time horizon. Compliance costs include the addition of the labor hour equivalent of about –one to three additional crewmembers nationwide annually to certain train movements for existing operations (an estimated cost of roughly \$120,000 – \$200,000 annually over 10 years, undiscounted), off-setting actions required by FRA in order for a railroad to obtain FRA approval to start up new fewer than two-person crew operations, and information submission and data analysis.

FRA estimated a 10-year cost range which would be between \$7.65 million and \$40.86 million, undiscounted. Discounted values of this range are \$5.19 million and

\$27.72 million at the 7-percent level. FRA is confident that the benefits outlined in this NPRM would exceed the costs. Preventing a single fatal injury would exceed the break-even point in the low range and preventing five fatalities would exceed the break-even point at the high range. The proposed rule will help ensure that train crew staffing does not result in inappropriate levels of safety risks to railroad employees, the general public, and the environment, while allowing technology innovations to advance industry efficiency and effectiveness without compromising safety. The proposal contains minimum requirements for roles and responsibilities of second train crewmembers on certain operations and promotes safe and effective teamwork. Due to lack of information, these cost estimates do not include any safety costs from using two-person crews instead of one or zero person crews, such as additional accidents caused by non-engineer crew distracting the engineer or additional deaths and serious injuries from having more people on board trains involved in accidents.

FRA is confident that the proposed rulemaking would generate the benefits necessary to at least break-even. These benefits would result from improved post-accident/incident emergency response and management, reporting of troubled employees due to drug and alcohol use, compliance with restrictions on electronic device use in place to prevent distraction, and the potential avoidance of a high-consequence train accident. While FRA does not have information that suggests that there have been any previous accidents involving one-person crew operations that could have been avoided by adding a second crewmember, this rule would break even with its estimated costs if it prevents one fatal injury or high-consequence accident in the first 10 years of the rule

(and no additional safety costs result from the presence of additional crew). This proposed rule would help ensure that passengers and high risk commodities are transported safely by rail and FRA is confident that the resulting safety benefits would justify the costs. The cost increase would result from additional crewmembers on the trains that are currently operating with a one-person crew and from the possibility that the railroad is required to use more technology to mitigate the risk related to crew conversions. FRA has assessed both co-proposals and concluded that monetary, quantifiable costs under both co-proposals are equal. However, railroads may perceive each option differently, especially as it pertains to business risk. Under co-proposal Option 1, railroads would have to wait for approval and that would delay implementation of crew size reduction in the short-term. However, once FRA grants approval railroads would have spent adequate amount of resources to meet regulatory requirements and oversight. Under co-proposal Option 2, each railroad would be able to initiate crew reductions after a petition is submitted to FRA. This means that railroads would be able to reduce costs once petitions are submitted. However, under co-proposal Option 2, railroads may assume more business risk as an initiated crew reduction would be subject to regulatory action (discontinuance or more conditions for approval). This means that railroads could end up acquiring equipment or resources for unapproved crew reductions or to modify initial plans for crew reductions. This would be costly and bring more uncertainty to the railroads' business plans in the short-term.

FRA conducted a sensitivity analysis of its first co-proposal using a 20-year time horizon and a scenario with a more rapid crew size reduction schedule. FRA estimates

that the cost range of the co-proposals would be \$7.44 million to \$36.25 million over this timeframe using a 7-percent discount rate, and \$11.93 million to \$50.71 million using a 3-percent discount rate.

## **II. Background**

### **A. Analysis of Two Recent Catastrophic Accidents Raising Crew Size Issues**

During the last five months of 2013, the railroad industry had two accidents that suggest the need for greater Federal oversight of crew size issues. The first incident at Lac-Mégantic, Quebec, Canada, was the driving force for bringing the crew size issue to FRA's Federal advisory committee known as the Railroad Safety Advisory Committee (RSAC). While Canada's Transportation Safety Board could not conclude that use of a one-person crew was a cause or contributing factor to the accident, as described below, the Lac-Mégantic accident involved a one-person crew that did not properly secure a train at the end of a tour of duty leading to a deadly, catastrophic accident.

The RSAC includes representatives from all of the agency's major stakeholder groups, including railroads, labor organizations, suppliers and manufacturers, and other interested parties. (An RSAC overview is provided below.) During the time that the RSAC's Working Group was deliberating whether it could make recommendations to FRA on the crew size issue, the other accident summarized here occurred. This accident involved trains carrying multi-person crews and is illustrative of the positive mitigation measures multiperson train crews took following a track-based derailment of one train that led to a second train colliding with the first (Casselton, ND). With regard to the Lac-Mégantic accident, FRA exercised its oversight following the accident through use of its



emergency order authority to ensure that the railroad involved had at least one adequate backstop to human error. FRA has also issued several other regulations to address the safety issues raised by these accidents which are described within the summaries of the accidents.

Lac-Mégantic, Quebec, Canada

FRA published Emergency Order 28 (78 FR 48218) on August 7, 2013, (issued on August 2, 2013) which contains the preliminarily known details of the events on July 5–6, 2013, that led to the catastrophic accident at Lac-Mégantic. On August 20, 2014, the Transportation Safety Board (TSB) of Canada released its railway investigation report, which refines the known factual findings and makes recommendations for preventing similar accidents. TSB of Canada Railway Investigation R13D0054 is available online at <http://bit.ly/VLqVBk>. In summary, an unattended train on mainline track did not stay secured and rolled down a grade to the center of town, where 63 of the 72 crude oil tank cars in the train derailed, and about one-third of the derailed tank car shells had large breaches. There were multiple explosions and fires causing an estimated 47 fatalities to the general public, extensive damage to the town, and approximately 2,000 people to be evacuated from the surrounding area.

The train had been secured by its one-person crew prior to it being left unattended. Because of a mechanical problem with the train, the engineer left the train running. Prior to leaving the train, the engineer consulted with another railroad employee about how to handle the problem and applied brakes on the train. However, TSB of Canada determined that the one-person crew did not comply with the railroad's rules

requiring the hand brakes alone to be capable of holding the train. According to the railroad's rules, a 72-car train should have had a minimum of nine hand brakes applied. Instead, the one-person crew used a combination of the locomotive air brakes and seven hand brakes to give the false impression during the verification test that the hand brakes alone would hold the train. TSB of Canada concluded that, without the extra force provided by the air brakes, a minimum of 17 and possibly as many as 26 hand brakes would have been needed to secure the train, depending on the amount of force with which they had been applied. Testing conducted by TSB of Canada concluded that it would have been possible for a single operator to apply a sufficient number of hand brakes within a reasonable amount of time. Shortly after the one-person crew left the train, the local fire department responded to an emergency call about a fire on the train. The responders followed the railroad's instructions in shutting down the locomotive and then extinguished the fire. The responders met with an employee of the railroad, a track foreman, to discuss the train's condition prior to departing the area. The track foreman dispatched by the railroad did not have a locomotive operations background. With all the locomotives shut down, the air compressor no longer supplied air to the air brake system, the air leaked, and the air brakes gradually become less effective until the combination of locomotive air brakes and hand brakes could no longer hold the train.

In the aftermath of the Montreal, Maine and Atlantic Railway (MMA) derailment at Lac-Mégantic, Transport Canada issued an order for all Canadian railroad companies to provide for minimum operating crew requirements considering technology, length of train, speeds, classification of dangerous goods being transported, and other risk factors.

In response, MMA changed its operating procedures to use two-person crews on trains in Canada. However, FRA was concerned that MMA did not automatically make corresponding changes to its operating procedures in the U.S. even though the risk associated with this catastrophic accident also exists in the U.S.<sup>1</sup> It may have been that, without a specific two-person train crew requirement in the U.S., MMA did not feel compelled to take any action to enhance the safety of its U.S. operations in a like-minded way to the preventive measures it took in Canada.

The Lac-Mégantic accident is also relevant to the issue of crew size because the tank cars that derailed were carrying crude oil from the Bakken deposit in North Dakota and Montana and this proposed rule carries forward FRA's position that at least a two-person train crew is warranted on any train carrying 20 or more tank cars loaded with crude oil or ethanol. Over the past few years, a technological advancement has allowed crude oil to be recovered from under nonpermeable shale rock. This advancement of hydraulic fracturing, better known as "fracking," resulted in a substantial increase in crude oil shipments in both Canada and the U.S. between 2009 and 2015.<sup>2</sup> The prevalence of crude oil tank cars on U.S. railroads, and the volatility of some of the blended crude oil from different sources or mixed with the chemicals used in the fracking process, suggested that Bakken crude oil might have a significantly greater potential to be improperly classified and packaged for transportation. Investigators initially considered

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<sup>1</sup> Letter from Joseph C. Szabo, FRA Administrator, to Mr. Edward Burkhardt, CEO of MMA (Aug. 21, 2013), placed in the docket.

<sup>2</sup> [https://www.eia.gov/dnav/pet/PET\\_MOVE\\_RAILNA\\_A\\_EPC0\\_RAIL\\_MBBL\\_M.htm](https://www.eia.gov/dnav/pet/PET_MOVE_RAILNA_A_EPC0_RAIL_MBBL_M.htm)

that improper classification and packaging was likely a contributing cause to the catastrophic result at Lac-Mégantic. Consequently, DOT has taken or is taking a variety of actions to address the issues created by transporting crude oil produced through fracking from various approaches. See, the following examples

- FRA’s Emergency Order 28, 78 FR 48218, Aug. 7, 2013.
- FRA’s Safety Advisory 2013-06, 78 FR 48224, Aug. 7, 2013, jointly issued with the Pipeline and Hazardous Materials Safety Administration (PHMSA) (discussing the circumstances surrounding the Lac-Mégantic accident and making certain safety-related recommendations to railroads and crude oil offerors).
- FRA’s Safety Advisory 2013-07, 78 FR 69745, Nov. 20, 2013, jointly issued with PHMSA (reinforcing the importance of proper characterization, classification, and selection of a packing group for Class 3 materials and the corresponding requirements in the Federal hazardous materials regulations for safety and security planning after the Lac-Mégantic accident).
- FRA’s Safety Advisory 2014-01, jointly issued with PHMSA, 79 FR 27370, May 13, 2014, (encouraging the use of railroad tank car designs with the highest level of integrity reasonably available).
- PHMSA’s final rule, issued in coordination with FRA, “Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High Hazard Flammable Trains,” 80 FR 26643, May 8, 2015, (adopting new operational requirements for certain trains transporting large quantities of flammable

liquids known as “high-hazard flammable trains” (HHFT), creating improvements in tank car standards, providing a sampling and classification program for unrefined petroleum-based products; and creating notification requirements).

- FRA’s final rule “Securement of Unattended Equipment,” 80 FR 47349, Aug. 6, 2015, (adopting requirements to prevent unattended trains that carry crude oil, ethanol, poisonous by inhalation (PIH), toxic by inhalation (TIH), and other highly flammable contents from rolling away).

Also, in 2013, DOT launched Operation Safe Delivery (OSD), which is examining the entire system of crude oil delivery. OSD concluded, after months of unannounced inspections, testing, and analysis, that “the current classification applied to Bakken crude is accurate under the current classification system, but that the crude has a higher gas content, higher vapor pressure, lower flash point and boiling point and thus a higher degree of volatility than most other crudes in the U.S., which correlates to increased ignitability and flammability.” See OSD Update (July 23, 2014) summarizing PHMSA and FRA testing results of Bakken crude oil as of May 2014; available online at <http://1.usa.gov/1piQJB1>.

Some people in the railroad industry view the accident at Lac-Mégantic as having nothing to do with crew size. They argue that there are potential safety benefits to single-person train operations, such as increased attentiveness by the lone operator because of the absence of a second crewmember on whom to rely. It is also said that there are fewer distractions from extraneous conversations. The TSB of Canada report on the Lac-

Mégantic accident found that it could not be concluded that a one-person crew contributed to the accident. However, TSB of Canada found that the risk of implementing single-person train operations is a risk that must be addressed because it is related to unsafe acts, unsafe conditions, or safety issues with the potential to degrade rail safety. TSB of Canada concluded that addressing the risk of one-person operations is essential to preventing future similar accidents, even if the risk itself cannot be determined to directly have led to this accident.

Related to the risks associated with one-person operations, TSB of Canada found that MMA did not have a strong safety culture, which made MMA a poor candidate to implement one-person operations. For instance, TSB of Canada notes that an organization with a strong safety culture is generally proactive when it comes to addressing safety issues, and yet MMA was generally reactive. MMA had significant gaps between the company's operating instructions and how work was performed day-to-day. Furthermore, TSB of Canada's investigation found MMA had inadequate training, testing, and supervision. In contrast, an effective safety culture is characterized by an informed workforce where people understand the hazards and risks involved in their own operation and work continuously to identify and overcome threats to safety.

At the time of the accident, there were no rules or regulations preventing Canadian railroads from implementing one-person train operations. Thus, TSB of Canada concluded that the risks posed by one-person operations suggest that Transport Canada, i.e., Canada's DOT, should consider whether each railroad has the measures in place to mitigate those risks by creating a process to approve and monitor each railroad's

one-person operation plans. TSB of Canada reasoned that if one-person operations are implemented “without identifying all risks, and if mitigation measures are not implemented, an equivalent level of safety to that of multi-person crews will not be maintained.” Considering that there are only two Canadian railroads that have operated using one-person operations, TSB of Canada seems to be making a prudent recommendation before one-person operations are more widely used throughout the Canadian rail system. This is the exact lesson learned that FRA would like to apply to U.S. rail operations through promulgation of this rulemaking.

Even though TSB of Canada was not able to conclude that having another crewmember would have prevented the accident, and certainly FRA agrees that this could not be determined with any absolute certainty, it is distinctly possible that a train crew with a minimum of two-persons would have had more options available to secure the train safely, thereby potentially posing less of a risk of a runaway train. This was an issue raised by some labor members of FRA’s Federal advisory committee and has some support in TSB of Canada’s report. For instance, a one-person crew was limited to where the train could be parked so that it would not block a grade crossing, where it is significantly more feasible operationally for a two-person crew to choose to split the train and park each part on a lesser grade than the choice left for the one-person crew. There are four main reasons why splitting a train is generally considered a two-person job: (1) if a one-person crew leaves the locomotive cab unoccupied and has not taken appropriate measures to secure the train, it could become a runaway; (2) even if the train is secure, some cars may move depending on the terrain, making it difficult for the one-person crew

to go between cars at a desired location without applying hand brakes, which can be time-consuming and strenuous work; (3) depending on the length of the train, it could be time-consuming for the one crewmember to walk the train to get to the desired location for a cut and find that the car needs to move to release the coupler lock; and (4) when the one-person crew stops occupying the lead locomotive cab, the train and crew are more vulnerable to vandalism and malicious acts by trespassers who might actually want to operate the train. In addition, a second person might be needed to flag a grade crossing and it would be easier to reposition one or more cars with a second crewmember.

Another issue that favors two-person crews is that a TSB of Canada survey determined that there were instances when MMA one-person crews applied less than the minimum number of hand brakes required by MMA's rules and that the minimum hand brake requirement was more consistently met when trains were operated by two crewmembers. This seems to be the case here, as the engineer only set seven hand brakes instead of the minimum of nine. Although TSB of Canada's investigation found that even nine hand brakes would not have been enough to hold the train, a second crewmember could have ensured proper securement if the railroad had issued proper instructions regarding the minimum number of hand brakes to apply. Even TSB of Canada's report summarizing its investigations of other shortline runaway train accidents that it investigated previously suggests that, without having another crewmember available, no other person had the opportunity to verify whether the train was properly secured. Additionally, although it is not unusual for some types of locomotives to smoke and that the engineer did contact the railroad and was told to leave the engine while it was smoking, TSB of Canada found that



the taxi driver that questioned the decision to leave the locomotive in a smoking condition did not carry the same weight as a qualified railroad employee. Similarly, the one-person crew and the dispatcher did not discuss the MMA procedure requiring that a locomotive be shut down due to abnormal smoke, and TSB of Canada states that it is impossible to conclude whether the presence of another crewmember would have resulted in different actions to secure the train – although FRA believes it is impossible to exclude either.

Thus, in consideration of the safety concerns involved in the rail transportation of crude oil, the catastrophic accident at Lac-Mégantic serves as the trigger to create redundant safeguards that have a high potential of preventing other accidents. FRA’s position is reinforced by research and review of accident information, which confirms that railroads that provide two qualified crewmembers, who can work as an effective team on those unit trains (which commonly consist of over 100 loaded tank cars of crude oil), improve the safety of those operations.

#### Casselton, ND

Another train accident illustrates how having multiple train crewmembers can improve safety for the general public and the crewmembers themselves. On December 30, 2013, an eastbound BNSF Railway (BNSF) “key train,” consisting of two head end locomotives, one rear distributive power unit (DPU), and two buffer cars on each end of 104 loaded crude oil cars, collided with a car from a westbound BNSF “grain train” that had derailed less than 2 minutes earlier from an adjacent main track. Thirteen cars in the middle of the 112-car grain train had derailed, most likely due to a broken axle on the

45th railcar, and that railcar ended up fouling the main track the key train was operating over. The collision derailed the key train's two leading locomotives, as well as the first 21 trailing cars behind the locomotives. After the collision, an estimated 474,936 gallons of crude oil was released from 18 loaded tank cars fueling a fire which caused subsequent explosions as the loaded oil tank cars burned. The local fire department had requested that nearby residents voluntarily evacuate immediately following the collision and approximately 1,500 residents did evacuate. The voluntary evacuation was lifted approximately 25 hours after the collision. There were no injuries to crewmembers, emergency responders, or the general public, but images and video of the burning railcars made the accident national news.

Many members of the general public who viewed the news accounts of burning wreckage may not be aware that the heroic actions of the grain train's crewmembers potentially prevented the environmental and property damages from being much worse, in addition to potentially shortening the evacuation period. The grain train was operated by a three-person crew, which included a locomotive engineer, a conductor, and a student locomotive engineer (i.e., a conductor training to be a locomotive engineer). Post-accident, the grain train crew was approached by the Assistant Fire Chief of the Casselton Fire Department who asked whether the crew could assist the emergency responders by pulling a cut of tank cars away from the burning derailed cars. Upon receiving the request, a BNSF road foreman of engines consulted with the crew to see if the crewmembers believed it was safe to move the cars, which they did. The grain train's locomotive engineer and student locomotive engineer went to the DPU on the key train

and the conductor and road foreman of engines went to the east to the nearest grade crossing and made a cut of an estimated 50 tank cars. The engineer and student engineer then pulled the cars about a quarter of a mile west away from the burning train.

Approximately 45 minutes after that move was completed, the Assistant Fire Chief met the grain train's crew again and asked if additional tank cars from the key train could be moved. The grain train's crew made contact with a BNSF trainmaster and communicated the request. The trainmaster told the crew that if the move could be completed safely, they had permission to proceed. The student engineer borrowed the Assistant Fire Chief's fire protective clothing and walked within 10 car lengths of the fire and uncoupled approximately 20 additional cars from the burning train. Then, the locomotive engineer coupled to these cars and moved them to the west creating a safety gap of approximately 25 to 30 car-lengths from the burning cars.

Adding these two emergency response moves together, the grain train's crew was responsible for moving approximately 70 loaded crude oil cars in the key train out of harm's way. These urgent moves would have been much more time consuming and logistically difficult if the grain train was operated with only a one-person crew. For those reasons, there is a question of whether either of these emergency response moves would have been attempted with a one-person crew.

Meanwhile, it is arguable that the two-person key train crew benefited from each other's presence in the cab of the controlling locomotive. The crew helped each other through the emergency by issuing appropriate warnings and sharing tasks. First, the locomotive engineer was able to warn the conductor to get down and brace for impact 4

to 5 seconds before colliding with the derailed grain train railcar, and they both were able to get down on the floor and brace themselves. The conductor admitted that he had never been in a situation where a collision was imminent, and he did not know what he was supposed to do. Although a one-person crew would not need to warn another crewmember of an impending impact, this is an example of an expert crew working together. Second, after the impact, the crew was able to assess that they were not seriously injured, and it was the conductor who first noticed that their train was on fire when he looked out the window and was able to warn the locomotive engineer of that fact. This is a clear example of the benefit a second crewmember can provide. Without a second person, the engineer may not have realized that he was in immediate danger. Third, upon hearing this news, the engineer told the conductor to “grab your cell phone and run.” This is another example of effective teamwork during an emergency situation. Some people do not think as clearly as others during an emergency and, in this case, the engineer, with about 9 years of experience, recognized that it was important for him to instruct the conductor with less than 2 years of experience that the crew should have their cell phones to report information and to leave the locomotive quickly. Fourth, the engineer announced the collision by radio. Reporting the incident as quickly as possible is always crucial to getting first responders to the scene of an accident. By contacting the dispatcher on the railroad’s radio, the engineer was taking an important precaution to ensure other railroad operations were not adversely impacted. Had this been a one-person crew, there is a question of whether the engineer might have desired to exit the locomotive first and then notify the dispatcher, assuming the engineer believed his life

was in immediate danger. Having a second crewmember present working to exit the locomotive may have freed the engineer to report the accident. Fifth, the conductor attempted to exit the front door while the engineer was reporting the accident over the radio, but finding it jammed shut, the conductor departed the locomotive through the back door located behind the engineer's seat. The engineer soon followed the conductor as it was clearly determined to be the only viable way to exit the locomotive. As the crew escaped from the locomotive, the conductor described the heat from the fire as "intense." The crew could not get away from the locomotive quickly as they found themselves in knee-deep snow immediately upon exiting the locomotive. About a minute after exiting the locomotive, it was engulfed in flames. Sixth, they ran together away from the train with the engineer using his cell phone on the run to call 911 and the conductor answering the dispatcher's call on the conductor's cell phone. Thus, the two crewmembers were able to simultaneously assist with providing different officials with information that would assist the railroad and first responders. Seventh, when the engineer found out local citizens were at the crash site, he strongly urged the local police to get those citizens away from the site because the oil train was just like the one in (Lac-Mégantic) Canada, and the deputy sheriff recognized the danger. These two crewmembers worked as a team in an emergency situation to divide up tasks, warn the dispatcher and local emergency responders, and protect each other's safety. Fortunately, neither crewmember suffered any serious injuries preventing them from escaping the damaged locomotive or running to safety. Certainly, with two crewmembers, there is the potential that both crewmembers could be hurt, but there is also the possibility that one

crewmember could physically assist an injured colleague. FRA believes that, from a post-accident risk mitigation standpoint, this accident is illustrative of the safety benefits a second crewmember can provide and that railroad operations, railroad crewmembers, the environment, and the general public are better served by the availability of a second crewmember. As explained in relation to the Lac-Mégantic accident, it is often impractical to expect a one-person crew to split a train, and in the case of an accident, there are added concerns regarding a one-person crew's ability to maintain communications with the dispatcher and emergency personnel while performing this potentially dangerous emergency movement. For instance, although an employee is permitted to use a cell phone during emergency situations involving the operation of the railroad under 49 CFR 220.309(b), the employee would have to remember to grab it, and the dispatcher and emergency personnel might not know the employee's phone number. If the employee took a portable railroad radio while conducting the train splitting operation, there is a significant probability that the radio signal would not be strong enough to communicate with the dispatcher. These concerns also do not take into account the fact that FRA purposely prohibits the use of electronic devices during railroad operations as they can be distractions that lead to preventable injuries and accidents. See 49 CFR part 220, subpart C. The benefits of a second crewmember following an accident may be especially useful when the commodities hauled pose significant risks, or a single crewmember is injured or is simply unable to perform as many tasks as quickly as two crewmembers.

**B. Research Identifies Crewmember Tasks and the Positive Attributes of**

## **Teamwork; Raises Concerns with One-Person Crews, Especially When Implementing New Technology**

Before FRA asked RSAC to consider accepting a crew size task, FRA was aware that some research revealed significant safety concerns with one-person crew operations. To aid the Working Group in its development of recommendations for appropriate crew size minimum standards, FRA provided five FRA-sponsored research reports, as well as one Transportation Research Board (TRB) conference report that contains presentations from multiple research reports, prior to the first meeting. This background offers a summary of the important findings of these reports, as well as a list of those reports presented, with an internet link to each report.

(1) “Cognitive and Collaborative Demands of Freight Conductor Activities: Results and Implications of a Cognitive Task Analysis–Human Factors in Railroad Operations,” Final Report, July 2012, DOT/FRA/ORD-12/13. The research and report was performed by the John A. Volpe National Transportation Systems Center. The report is available online at <http://www.fra.dot.gov/eLib/details/L04331>.

A primary finding of this FRA-sponsored study is that conductors and locomotive engineers operate as a joint cognitive system. The findings indicate that the conductor and the locomotive engineer function as an integrated team that often operate as a single unit with a common goal. These two crewmembers not only work together to monitor the operating environment outside the locomotive, they also collaborate in planning activities, problem solving, and identifying and mitigating potential risk. A conductor is defined as the crewmember in charge of a train or yard crew. Freight conductors

supervise pre-trip activities, over-the-road operation, and post-trip activities to ensure overall safe and efficient train movement.

The freight conductor's role has evolved from primarily a physical in nature job to one that emphasizes cognitive work. The research identifies five broad categories of cognitive job duties that a freight conductor normally faces, which raises issues for each railroad that might be considering one-person train operations and how the one-person operation can be as safe as a two-person operation.

One of those five categories of cognitive job duties is to manage the train consist, including the train makeup. This duty requires the freight conductor to understand train makeup rules and apply them both in the yard and on the mainline. Experienced conductors understand the implications of car placement, car consist, and car weight and shape when building trains. Conductors must understand how the train's consist will affect train handling, which is important to ensure locomotive engineer compliance when operating the train. (It is possible that this duty could also carry over to passenger train conductors, if there were different types of passenger cars in the same train that had the potential for compatibility issues, e.g., incompatible doors.)

Second, a freight conductor also has the duty to coordinate with the engineer for safe and efficient en route operations, which includes checking speed, signal indications, and engineer alertness. This duty could also include filling an engineer's knowledge gap about a territory (e.g., the conductor instructs the engineer where to place a train of a certain length so the train does not block a crossing). The conductor also serves to remind the engineer about upcoming signals and slow orders and provides "look ahead"



information to alert the engineer about hills, curves, grade crossings, and other physical characteristics of the territory that have the potential to cause operational problems. If the locomotive engineer is not in compliance with the railroad's operating rules, it is the conductor's job to bring it to the locomotive engineer's attention, or take appropriate corrective action that may include actuating the emergency brake to bring the train to an emergency stop if the conductor feels the train, its crew, or others outside the train are in danger. A significant finding was that operating in mountain-grade territory adds complexity to the job and introduces additional cognitive demands on both the conductor and the locomotive engineer.

Third, a freight conductor's duties usually extend to taking the lead on interacting with non-crewmembers, such as dispatchers and roadway workers. These communications with non-crewmembers typically takes place by radio. There may be expected and unexpected radio communications, and there may be lulls in communication and times of heavy interaction that require conductors to multitask in order to simultaneously receive/copy information received by radio while calling out signals and speed restrictions.

Fourth, the freight conductor's duties require diagnosing and responding to train problems, as well as dealing with other exceptional situations.

Fifth, railroads typically assign the freight conductor the job of managing the train crew's paperwork. Examples of paperwork managed by a freight conductor include the conductor's log, writing down orders, copying bulletins for both crewmembers received by radio, and keeping an up-to-date rulebook. When a conductor is handling all of these

duties, the safety benefit is that the engineer can concentrate on operating the train.

Another issue mentioned separately in this study's final report is that in order to gain the cognitive skill and knowledge to be an expert freight conductor, a person needs about 5 years of experience. This is because there are a significant number of overarching cognitive challenges that differentiate expert conductors from less experienced ones. A quick list of these overarching cognitive challenges include knowledge of the territory, the ability to maintain situational awareness of surroundings, the ability to project the effect of consist on train dynamics, the ability to problem-solve, the ability to plan ahead, the ability to multitask, the ability to exploit external memory aids, and the ability to foster situational awareness through active communication. The study concluded that less experienced conductors are less able to handle situations that require multiple demands on attention, and they are less able to effectively problem-solve, plan ahead, or identify and avoid potential hazards. Because they have had less "first-hand" experience on the job, they are typically less confident in their knowledge and ability. Having a two-person crew broadens the number of experiences from which the crew can draw from.

This research also addresses the role of PTC technology and whether it can substitute for a conductor, thereby paving the way for one-person operations. The cognitive task analysis addresses this issue by laying out the multiple ways in which conductors contribute to safe and efficient train operations and contrasts this with the anticipated features of PTC systems. The report concludes that PTC can provide warnings of upcoming signals, work zones and speed restrictions; however, PTC cannot

account for all the physical and cognitive functions that a conductor currently provides. For instance, conductors can support locomotive engineers in monitoring events outside the cab window for potential obstacles and hazards undetected by automated systems (e.g., people working on or around the track, trespassers, cars at grade crossings). FRA acknowledges that to the extent railroads comply with this rule using crewmembers in places other than the controlling cab, the crewmember is less likely to be able to provide this function. Other functions the conductor provides is filling knowledge gaps that locomotive engineers may have, supporting decision making, handling unanticipated events, and keeping the locomotive engineer alert, especially on long, monotonous trips where there is a risk of falling asleep. For this reason, the research recommends that each railroad seeking implementation of one-person operations in the future compile a detailed list of all of the physical and cognitive tasks both the engineer and conductor perform in the cab, determine which of these tasks PTC will cover, and understand how the locomotive engineer's responsibilities would change in a one-person operation. Of course, as the one-person crew would presumably have more required tasks than an engineer in a two-person crew (even if PTC addresses some of those tasks), the railroad should consider how the strain of additional responsibilities may impact situational awareness. FRA requests comments on how railroads can and do safely and effectively perform these tasks using one-person crews.

Removal of the freight conductor from the most common arrangement of a two-person train crew team would have significant implications for the remaining one-person crewmember. One-person train crews would need to absorb the physical tasks necessary

for operations, as well as the many cognitive tasks. Some of the freight conductor's current cognitive duties would be impossible with one person. For example, with a one-person crew, there will not be a second crewmember to fill in the knowledge or experience gaps of the sole crewmember. One of the problems is that inexperienced people "don't know what they don't know" and therefore cannot anticipate the risk and challenges, and cannot prepare for them. Pairing a conductor and locomotive engineer so that at least one of them is highly experienced can mitigate that problem.

Another potential issue of one-person crews is that it eliminates the opportunity to work as a conductor before promotion to locomotive engineer. This is a two-fold problem. First, engineers do not get the experience of separately learning the freight conductor position. Second, engineers who are never conductors are likely to begin their engineer careers with less railroad experience than those who first become conductors. Railroads that have used previously promoted conductors for their current one-person operations may find a shortage of such competent candidates to promote within the company if they eliminate the conductor position.

(2) "Rail Industry Job Analysis: Passenger Conductor," Final Report, dated February 2013, DOT/FRA/ORD-13/07. The research and report was performed by the John A. Volpe National Transportation Systems Center and can be found online at <http://www.fra.dot.gov/eLib/details/L04321>.

The purpose of this analysis was to identify key aspects of the passenger train conductor job, including the main responsibilities of the job, and the kinds of knowledge, skills, abilities, and other characteristics (KSAOs) required to successfully perform the

job. The results of the analysis are useful to the railroad industry for three reasons. First, the results can be used to build training programs that address relevant and measurable KSAOs. Second, the results can be used to form the foundation for performance appraisal systems that are legally defensible and evaluate employees based on KSAOs that have been identified as related to the job. Third, the results can be used to help ensure that a hiring organization will appropriately screen new talent.

In relation to the crew size issue, this study is relevant because it explains the wide variety of KSAOs a passenger train conductor needs to possess in order to do the job well. Therefore, if a passenger railroad employs only a one-person train crew, there is a question of how one-person can do all of these tasks and the tasks required of a locomotive engineer. Examples of passenger conductor KSAOs include knowledge of operating and safety rules, skill in working on and around moving equipment, judgment and decision-making ability, and a commitment to safety. Conductors use a number of different tools and types of equipment, and work with a variety of railroad personnel such as locomotive engineers, dispatchers, and foremen. The job is also physically and psychologically demanding for workers because of the prevalence of irregular work hours, out-of-doors work, and the need to lift and move heavy equipment. Passenger conductors also need to be able to carry out tasks involving passenger interaction; crew communication; crew supervision; form and record management; train inspection, troubleshooting, and repair; train makeup and handling; and emergency situations.

(3) “Fatigue Status in the U.S. Railroad Industry,” Final Report, dated February 2013, DOT/FRA/ORD-13/06. This report can be found online at [www.fra.dot.gov/Elib/Document/2929](http://www.fra.dot.gov/Elib/Document/2929). The research and report was performed by

QinetiQ North America and an Engineering Psychologist within FRA's Office of Research and Development.

Train and Engine (T&E) workers, such as locomotive engineers and conductors, are safety-critical railroad employees that have the highest exposure to fatigue in the railroad industry. They are also among employees that have the longest work hours and work at night. Passenger T&E workers, as a group, are workers with the least fatigue exposure because of the predictability of their schedules and less nighttime work; however, some passenger or commuter workers are required to stay at an out-of-town location and do not return to their starting location at the end of the work period. Freight T&E work can be divided into two groups: (1) "road freight" work which involves moving trains over long distances between major terminals or interchange points and frequently requires overnight stays at an out-of-town location, and (2) "local freight" work which involves moving trains between a railroad yard and a nearby location so that the employee returns to the starting location at the end of the work period. Railroad workers are more likely to get less than seven hours of total sleep on a work day, which puts them at risk of fatigue.

Extrapolating from the findings in the study, it appears that a railroad considering a one-person train crew operation should consider whether the crewmember is likely to be fatigued. In a railroad's safety analysis, prior to implementing a one-person operation, it would be prudent for the railroad to consider what redundancy backstops have been implemented in case the crewmember falls asleep on the job. If FRA needed to review and approve an operation with less than two crewmembers, the agency would be looking

to see if the railroad implemented strategies for reducing railroad worker fatigue, such as improving the predictability of schedules, considering the time of day it permits one-person train crews to operate, and educating workers about human fatigue and sleep disorders. This study could help provide a railroad with some ideas for reducing fatigue in its train crewmembers.

(4) “Technology Implications of a Cognitive Task Analysis for Locomotive Engineers–Human Factors in Railroad Operations,” Final Report, dated January 2009, DOT/FRA/ORD-09/03. The research and report was performed by the John A. Volpe National Transportation Systems Center and can be found online at [www.fra.dot.gov/Elib/Document/381](http://www.fra.dot.gov/Elib/Document/381).

This report documents the results of a cognitive task analysis (CTA) that examined the cognitive demands and activities of locomotive engineers in today’s environment and the changes in cognitive demands and activities that are likely to arise with the introduction of new train control technologies. One of the objectives of this CTA was to understand these potential new performance demands. Another of the CTA’s objectives was to evaluate the interaction between the locomotive engineer and the conductor and how they work jointly to operate the train in a safe and efficient manner. At the time of the CTA, the researchers assumed that railroads would continue to use a two-person crew configuration and so the analysis in this report does not explicitly consider any additional sources of cognitive workload that may arise should there be a transition to single-person operations. The study notes that each crewmember has a duty to catch and correct the errors made by the other crewmember.

The research examined the following types of PTC systems: (1) communications-based train management (CBTM), (2) advanced speed enforcement system (ASES), (3) incremental train control system (ITCS), (4) electronic train management system (ETMS), and (5) North American Joint Positive Train Control (NAJPTC). This 2009 study acknowledges that the PTC systems are described and analyzed as they were implemented at the time of the site visits and, in some cases, the PTC systems may have undergone substantial redesign since then.

The results pointed to major cognitive challenges involved in operating a train, including the need for sustained monitoring and attention; maintaining an accurate situation model of the immediate environment (including the location, activities and intentions of other agents in the vicinity such as other trains and roadway workers); anticipating and taking action in preparation for upcoming situations; and planning and decision-making, particularly in response to unanticipated conditions (e.g., person or object obstructing the track). Introduction of new train control technology reduces some cognitive demands while creating new ones. For example, as four out of the five PTC systems tested used conservative braking profiles to slow the train to the desired target speed under restrictive assumptions (e.g., heavy train or slippery track), train crews discovered that they would need to initiate braking at an earlier point than they were normally accustomed to if they wanted to prevent the PTC system from braking the train for them. This earlier braking point conflicts with the experienced crews' effective strategies for operating as efficiently as possible. A penalty brake application is highly undesirable because it significantly delays train operations and may trigger report or



documentation requirements to explain why the penalty brake occurred. The report also discusses the implication of the results for design of in-cab displays and development of training, particularly for PTC systems. The research suggests there is a need for development of in-cab displays that make it easier to anticipate and stay within the braking curve without having to look closely at the in-cab display so that more attention can be directed to looking outside the window.

The PTC systems also created new sources of workload and distraction. Sources of workload and distractions include the need to acknowledge frequent (and often non-informative) audio alerts generated by the PTC system and the need for extensive input to the PTC system during initialization and when error messages occur while operating the train. For example, the NAJPTC system is described as having a train location determination system (LDS) that is able to locate train position within 10 feet but it would trigger a failure alarm when the LDS system experienced difficulty identifying the train location. The failure alarm sounded repeatedly, requiring the train crew's attention. Although this situation described was an early test of the system, and no consequences of failing to respond to the alert occurred, when the test period ends a failure to respond to an alert quickly might result in a penalty brake. The experiences of European railroads suggest that the concern expressed by the locomotive engineers regarding too many non-informative alerts has a potential for negative safety consequences. Operators may respond to poorly designed audio alerts automatically without fully processing their meaning, thus defeating their purpose. This is consistent with an extensive body of human factors literature that indicates that individuals are likely to ignore alarms when a

high false alarm rate exists. (Please note that FRA’s PTC regulation prohibits requiring a locomotive engineer to “perform functions related to the PTC system while the train is moving that have the potential to distract the locomotive engineer from performance of other safety-critical duties,” which would include distracting, non-useful alerts. See 49 CFR 236.1006(d)(1), formerly § 236.1029(f)).

The new cognitive demands created by new technologies such as PTC can lead to changes in how locomotive engineers operate the train. Locomotive engineers certainly combine the current information they can obtain from direct perception (e.g., displays inside the cab as well as the scene outside the cab), in addition to knowledge and skills gained through training and experience to develop train handling strategies. Sources of new cognitive demands include constraints imposed by the PTC braking profile that require locomotive engineers to modify train handling strategies, increases in information and alerts provided by the in-cab displays that require locomotive engineers to focus more attention on in-cab displays versus out the window, and requirements for extensive interaction with the PTC systems (e.g., to initialize it and to acknowledge messages and alerts) that impose new sources of workload. The research concluded that although PTC technology is likely to have a positive impact on overall risk of accidents, these new sources of cognitive demand can contribute to errors and accidents.

Railroads and PTC system designers need to be made aware that measures can be taken in the design of PTC displays and in development of user training to improve train crew performance and reduce the potential for human error. The final section of this report discusses a number of suggestions for ways to improve in-cab displays to reduce

cognitive demands on train crews and facilitate train crew performance as well as suggestions for improved training. For example, one promising area for research and development is improved in-cab displays that minimize the need to visually attend to the in-cab display to extract important information. The research found that a substantial learning curve exists to reach the point where the in-cab display does not serve as a source of distraction, diverting attention away from events out the window. Locomotive engineers must have sufficient experience in running a PTC-equipped train as part of training so that they get beyond the point where close monitoring of the in-cab display is required to avoid a penalty brake application.

Another PTC issue related to crew size is that PTC systems generally require manually entered inputs at the start of a trip and after a shutdown of the system during train operations. The train crew must enter information that the system will use as parameters for safe operation. These data entry tasks provide another source of workload and distraction, yet they are highly important because manual entry errors can have safety implications. With a one-person crew, the task burden would fall on the sole crewmember. Although a railroad might consider that if there is only one-person in the locomotive cab, the person should not operate without the PTC system operational, reinitializing the PTC system after it has initiated a penalty brake application can be a complex and time-consuming procedure. On one railroad described in the research, the procedure is so complex, difficult to follow, and time-consuming that, during the PTC system's trial period, the locomotive engineers were allowed to forego reinitializing the PTC system. However, the study noted that once the system becomes fully operational,

running a train without PTC activated may no longer be an option.

This study is important to the crew size issue because it challenges the possibility that a train with PTC is inherently safe with only a one-person crew and that no safety analysis or FRA oversight of the operation is warranted. The study concluded that although PTC technologies have the potential to improve safety and efficiency of railroad operations, they also have the potential to create new failure modes and impose new cognitive demands on locomotive engineers who need to monitor PTC displays and provide inputs to the system. For example, without PTC technology, locomotive engineers are highly engaged with the train operation, noticing visual cues (i.e., landmarks and mileposts), monitoring radio communications of other trains, and relaying information by radio to other trains about potential hazards. Some locomotive engineers even indicated that they get a variety of sensory-based cues that help them perceive their location, such as vibrations associated with a portion of track or a smell that reminds them they are near a farm. The research suggests that because the PTC technology may require locomotive engineers to focus more of their attention on in-cab displays, it will reduce their ability to monitor activity outside the cab and raises a question about whether the engineers will lose any situational awareness in relation to the coherent mental picture (i.e., the situation model) of where the engineer perceives the train to be based on prior experience. Typically, a locomotive engineer will use that situation model to help the engineer anticipate future events. Furthermore, the research concluded that train crews must avoid too much reliance on the new train control technologies because, if the system ever fails, the engineer must still be able to operate the train safely.

(5) “Using Cognitive Task Analysis to Inform Issues in Human Systems Integration in Railroad Operations–Human Factors in Railroad Operations,” Final Report, dated May 2013, DOT/FRA/ORD-13/31. The research and report was performed by the John A. Volpe National Transportation Systems Center and can be found online at <http://www.fra.dot.gov/eLib/details/L04589>.

Human Systems Integration (HSI) is defined as a systematic, organization-wide approach to implementing new technologies and modernizing existing systems that emphasizes the importance of the end-user in the system acquisition process. FRA sponsored this research because it would like the railroad industry to consider HSI when implementing new technologies such as PTC, energy management systems (EMS), and electronically controlled pneumatic (ECP) brakes in the locomotive cab. The expectation is that an HSI approach to railroad technology acquisition and implementation can increase user acceptance and usability of the technology, as well as increase the likelihood that it is deployed successfully. This report provides guidance to the industry with respect to the need for HSI in the technology acquisition process, and more specifically, how to use Cognitive Task Analysis (CTA) methods and results as part of the HSI process.

The nature of the work associated with many railway worker positions (e.g., locomotive engineers, conductors, and roadway workers) is rapidly shifting from being primarily physical to placing greater emphasis on cognitive demands (e.g., monitoring, supervising automated systems, planning, communicating and coordinating, and handling unanticipated situations). CTA methods provide a means to explicitly identify the

knowledge and mental processing demands of work so as to be able to anticipate contributors to performance problems (e.g., lack of information, high attention demands, inaccurate understanding) and specify ways to improve individual and team performance (be it through new forms of training, user interfaces, or decision-aids). CTAs can inform all aspects of HSI starting from early system requirements exploration and definition through late stage validation and field testing. The information in the report can serve as a lead-in to the kinds of insights that can be drawn from performing a CTA when introducing new technologies into railroad operations, as well as a starting point for the industry as far as identifying the likely emerging issues that need to be explored as a result of the introduction of new technology. For example, CTA methods can examine how the introduction of PTC might impact the monitoring demands placed on locomotive engineers, or alter the patterns of communication between locomotive engineers and other railroad workers. CTA methods can inform the design of systems that are more likely to be successful when deployed by ensuring that they address the specific performance challenges users face and are sensitive to the larger system context. A CTA can be used to better understand the various roles and responsibilities associated with each crew position to be able to assess which of those roles and responsibilities are eliminated (or taken on) by the new technology and which remain and must be accounted for in some other way if the crew position is eliminated. FRA has significantly aided this HSI analysis by previously sponsoring CTA reports that focused on railroad dispatchers, roadway worker activities, locomotive engineers, and freight train conductors (the two latter reports were previously described in this preamble section).

The report cites a prior research finding that the introduction of new technology does not necessarily guarantee improved human-machine system performance. Woods, D. & Dekker, S., “Anticipating the effects of technological change: A new era of dynamics for human factors,” *Theoretical Issues in Ergonomics Science*, 1(3), 272–282 (2000); National Research Council (NRC) Committee on Human-System Design Support for Changing Technology, “Human-System Integration in the System Development Process,” National Academies Press (2007), [http://www.nap.edu/catalog.php?record\\_id=11893](http://www.nap.edu/catalog.php?record_id=11893); and Wreathall, J., Woods, D. D., Bing, A. J. & Christoffersen, K., “Relative risk of workload transitions in positive train control,” Washington, DC: U.S. Department of Transportation, Federal Railroad Administration. DOT/FRA/ORD-07/12 (2007), <http://ntl.bts.gov/lib/42000/42400/42472/ord0712.pdf>. Poor use of technology can create additional workload for system users, can result in systems that are difficult to learn or use, or, in the extreme, can result in systems that are more likely to lead to catastrophic errors. The introduction of new technology results in the following types of common changes in operating practice: (1) changes in practitioner roles, including emergence of new tasks; (2) changes in what is routine and what is exceptional; (3) changes to the kinds of human errors that can occur; and (4) people in their various roles adapting by actively altering tools and strategies to achieve goals and avoid failure. HSI is a way to employ a comprehensive analysis, design, and evaluation process that mitigates the risk of designing systems that create potential mismatches between the technology and the human operator limitations or capabilities. For example, in reviewing the freight train

conductor CTA and how it could inform the HSI process regarding issues of one versus two-person train crew operation, the study concluded that “[i]t is not clear how the introduction of PTC will affect cognitive and collaborative processes, but findings suggest that it will not account for all the cognitive and physical support functions the conductor currently provides.”

The study found that there are other CTA methods that can be used to provide more fine-grained input to HSI analysis and design activities. For example, there are CTA methods that provide a more detailed, second-by-second description of the mental processes (e.g., perceptual processes, attention processes, memory store and retrieval processes) involved in performing complex cognitive tasks such as operating a train. The study provides descriptions and citations to these recent attempts to examine the microlevel (second-by-second) information processing involved in operating the train over a route. These more microcognitive-level analyses can be particularly helpful for analyzing attention and workload demands at an in-depth level.

In the emerging issues section of the report, the study explained that if a railroad chooses to transition to one-person operations based on technology such as PTC, a proper HSI analysis would require that the railroad answer certain fundamental questions about the operation for the system designers. For instance, will the engineer still be responsible for manually operating the train? If not, when will the engineer manually control the train? When will the software (automation) system operate the train with the engineer acting as supervisor? And, when will the roles be blended? Answers to these questions may introduce additional concerns. For example, situational awareness and operator



vigilance may become more of a concern when the engineer's role becomes more supervisory. If crew size is reduced to one person, how will the reduction in crew size impact safety when the one-person crew is used to relying on cooperative strategies with the second person that fosters shared situational awareness and creates safety nets?

(6) "Teamwork in U.S. Railroad Operations," A Conference, April 23-24, 2009, Irvine, California, Transportation Research Board, Number E-C159, dated December 2011. The many authors of the research and reports are listed in the publication which can be found online at <http://onlinepubs.trb.org/onlinepubs/circulars/ec159.pdf>.

This conference report discusses the key aspects of successful teams, such as train crews. The Transportation Research Board is a division of the National Research Council, and an independent adviser to the Federal government and others on scientific and technical questions of national importance. This particular conference drew upon the expertise of researchers and operating personnel concerned with human performance and human factors research issues related to railroad operations. The following is a summary of some of the relevant discussions in the conference report. The report contains citations to the research each presenter relied on in forming their analyses and conclusions.

One central theme is that teams do not become expert without guidance. They must be trained according to the established scientific principles. But training alone is not enough. To facilitate its success, organizations must promote and reinforce teamwork behaviors. Long-term organizational commitment is crucial to demonstrating that teamwork training is not just a fad, but is a central component of company policies and procedures. In other words, there needs to be a "culture of teamwork" embedded within

the organization.

Team performance can be improved when members effectively communicate. One effective example is when crews use periods of low workload to plan ahead, so that if a difficult situation arose, the explicit discussions become the basis for actions. Of course, a question implied from this report is that if the train crew consists of only one person, can the lone crewmember plan ahead during periods of low workload to the same extent as a crew of two or more persons who understand how to effectively communicate? Unfortunately, the conference report does not answer this implied question.

There are five critical components of teamwork: mutual performance monitoring, backup behavior, adaptability, team leadership, and team orientation. Although not addressed by the conference report, arguably three of these strengths of teamwork are lost when the team consists of only one person. Team orientation refers to a person's tendency to prefer working with others, which could certainly be problematic if a person with a team orientation is ordered to operate a train as a one-person team. Mutual performance monitoring refers to the ability to keep track of fellow team members' work while carrying out their own, to ensure that everything is running as expected, and to ensure that they are following procedures correctly. Mutual performance monitoring is necessary in teams in order to prevent teams from making errors and enable teams to engage in backup behaviors. Backup behavior occurs when a team member recognizes that another team member is in need of aid and offers assistance. Backup behavior requires team members to know enough about other team members' responsibilities to

anticipate their needs. Research has identified three types of backup behavior: (1) providing feedback to improve performance, (2) assisting a teammate in performing a task, and (3) completing a task for a team member who is overloaded. The benefits of mutual performance monitoring and backup behavior are simply lost when the team consists of a single employee.

One comment FRA heard during the RSAC Working Group meetings was that multiple person train crews could be less safe than a one-person crew because sometimes crewmembers distract each other from the train operation activities. This issue was addressed in the conference report with regard to a discussion of how expert teams perform versus non-expert teams. An example was given of a train accident in which a student engineer was allowed to operate a train independently, receiving no guidance through supervisor role modeling or feedback prior to a collision. The incident was an exemplary prototype of a non-expert team because not only were the crewmembers not trained adequately with effective feedback prior to the day of the accident, but also communication and coordination completely broke down between all team members directly before the incident. In contrast, expert teams have a clear and common purpose, as well as an understanding of each individual member's roles. It is that understanding that allows expert team members to anticipate each other's actions and back each other up when needed, as well as coordinate without explicit and lengthy communication. Furthermore, unlike non-expert teams, expert teams engage in a regular cycle of prebrief, performance, and debrief. This performance cycle engages the expert teams to identify high and low priorities, revise goals and plans, identify lessons learned, and evaluate

whether the team is or is not effective both in performing the task and identifying the needs of team members. The research in the conference report concludes that the main advantage of developing expert teams is that they have higher levels of performance. For example, expert teams make better decisions and fewer errors, which in turn enable expert teams to have a higher probability of mission success.

In yet another of the presentations in the conference report, an issue raised was whether internal and external communications of train crewmembers could be captured to consider the impact of new technology, such as PTC, on crew interactions and performance. The report states that making the most of new technologies to improve efficiency while maintaining safety and augmenting effectiveness will always present challenges, but that prudent application of team science in general and of communications analysis in particular can both facilitate their achievement and enhance their utility. The report explains that those technologies place new demands on train crews in terms of tasks to be performed, skills required, and the size and mix of both onboard and distributed teams. FRA notes that, based on RSAC Working Group discussions, some railroads appear ready to reduce train crew size from two persons to one, upon implementation of PTC, under what FRA and the presenters of this report suggest would be a wrong presumption that with PTC there would be less tasks for the crew to do or the tasks would be easier to accomplish with a single person. The report counters that presumption and suggests that the impact is unknown until PTC is implemented and the impact it would have on a two-person crew is studied.

### **C. The Acknowledged Limitations of FRA Accident/Incident Reporting Data**

FRA's accident/incident data is derived from the agency's requirements for railroads to record and self-report specific information to FRA. The purpose of FRA's accident/incident recordkeeping and reporting regulation, contained in 49 CFR part 225, is "to provide the Federal Railroad Administration with accurate information concerning the hazards and risks that exist on the Nation's railroads. FRA needs this information to effectively carry out its statutory responsibilities under 49 U.S.C. chapters 201-213. FRA also uses this information for determining comparative trends of railroad safety and to develop hazard elimination and risk reduction programs that focus on preventing railroad injuries and accidents." 49 CFR 225.1. Over the life of the part 225 regulation, FRA has amended these requirements in an effort to require railroads to improve the accuracy of their reporting. See 75 FR 68862, 68863-64 (providing an overview of part 225 and recent amendments). FRA does not investigate every reportable accident/incident, but frequently conducts audits and investigations to ensure that railroads are accurately reporting. In 2013, FRA conducted its own investigation of 89 train accidents/incidents that FRA determined might have greater significance to the industry or the general public. FRA did not have the resources to investigate all of the 1,781 train accidents/incidents railroads reported to FRA in 2013. FRA is not aware that any of the accidents/incidents it investigated involved a one-person crew operation.

Part 225's central provision requires that each railroad subject to part 225 submit to FRA monthly reports of all accidents and incidents that meet FRA's reporting criteria. 49 CFR 225.11. Railroad accidents/incidents are divided into three groups, each of which corresponds to the type of reporting form that a railroad must file with FRA: (1)

highway-rail grade crossing accidents/incidents (FRA Form F 6180.57); (2) rail equipment accidents/incidents (FRA Form F 6180.54); and (3) deaths, injuries and occupational illnesses (FRA Form F 6180.55a). See 49 CFR 225.19. For the reporting of deaths, injuries, and occupational illnesses that result from an event or exposure arising from the operation of a railroad, the FRA forms do not request that the railroad record the number of crewmembers as that distinction is unlikely to be pertinent to accident analysis for those types of accidents/incidents; instead, FRA only requires that the railroad report which crewmembers were injured, killed, or suffered an illness. Thus, it is impossible to search FRA's accident/incident database for those forms to find whether a death, injury, or occupational illness did arise from the operation of a train with a one-person crew. Meanwhile, for the first and second group, highway-rail grade crossing accidents/incidents and rail equipment accidents/incidents, the FRA forms record the number of crewmembers. The highway-rail grade crossing accidents/incidents form records the number of people on the train at the time of the accident (both passengers and train crew). The rail equipment accidents/incidents form records the number of crewmembers in boxes 40–43, with four different work positions listed: Engineer/Operator, Fireman, Conductor, and Brakeman. Obviously, FRA does not see as many Fireman and Brakeman listed as it once did, but they are still occasionally listed. The railroad must record the number of each type of crewmember that was working on the train at the time of the accident/incident. Thus, FRA is able to search the records to determine how many train crewmembers were assigned to a train that was involved in a reportable rail equipment accident/incident or a grade crossing

accident.

FRA is considering including in the final rule a requirement to report train crew size data in the deaths, injuries, and occupational illnesses accident report form. Such a regulatory change would allow FRA to have crew staffing information and to better assess the performance of train crews with less than two members. The benefits of this proposed change would be evaluated while FRA conducts a future comprehensive reform of its accident/incident reporting forms to modernize and meet data needs. As it relates to crew staffing and its characteristics, the impetus for this effort originated during the RSAC Working Group meetings regarding train crew size. This effort made it clear that there is a need to improve both the quality and the scope related to the collection of information of train crew staffing safety. As presented above, existing data forms do collect information about the number of crewmembers involved in a train accident. However, current reporting requirements do not provide all the information required to assess the safety performance of crews with less than two members. Likewise, FRA data needs outside of this rulemaking are numerous and need to be contemplated. For these reasons, FRA is engaged in an effort to review and determine what data collection practices need to be changed. However, FRA also concluded that this effort has to be thoughtful and broad to ensure it collects high quality data. FRA is considering how to prioritize items and decide what data to collect on items such as ECP brakes, PTC, or crude oil or ethanol transportation by rail. All these matters are of high priority and would have to be considered in a comprehensive manner to minimize information collection burden on the regulated community. This NPRM is useful to request public

input as it pertains to crew staffing data and determine what type of information collection needs to be refined or what clarification in the part 225 guidance needs to be amended to ensure forms are completed correctly. This input would be used to inform a future rulemaking that would propose changes to part 225, FRA Form F 6180.54, and its related guidance.

For the benefit of the RSAC Working Group, FRA reviewed nearly 12 years of railroad safety data between January 2002 and October 2013 by searching the F 6180.54 rail equipment accidents/incidents forms. FRA manually reviewed 1,443 reports and applied several filters to eliminate redundant reports, other than human-factor caused accidents/incidents, accidents/incidents that occurred within railroad yards, and accidents/incidents involving railroad maintenance equipment. After applying these filters, FRA was left with accidents/incidents that railroads informed FRA were caused by human error and involved a one-person crew operating on main track. The result of this review was that FRA identified 28 human-factor caused accidents/incidents involving one-person crews operating conventionally and four accidents/incidents involving remotely controlled operations on main track. Since FRA does not capture data that would provide information regarding the total operating mileage for one-person crew operations in the United States (or even two-person operations), it is impossible for FRA to normalize the data and be able to compare the accident/incident rate of one-person operations to that of two-person train crew operations to see if one-person operations appear safer or less safe. Additionally, one-person operations over this period are not constant and use of one-person train crews for operations on main track appear to be



increasing over the past several years, so there are additional factors that could make historical rates less of an indicator of current or future rates.

The accident/incident reports involving one-person train crews also do not clearly help determine that the accident/incident would have been prevented by having multiple crewmembers. FRA requires railroads to determine the primary cause of a rail equipment accident/incident and enter a primary cause code on the form. If possible, railroads are also encouraged to enter a contributing cause code on the form as well. FRA does not have a cause code that a railroad could use to indicate that a one-person train crew caused the accident. In other words, there is no cause code that directly suggests that the reporting railroad believes the accident/incident could have been prevented by having a second crewmember. Even if FRA were to add such a code, a railroad would have a disincentive to use it as doing so might suggest that the railroad employ more crewmembers, increasing wage costs. Of course, if a railroad thought that only having one person was a factor, FRA has a cause code, M599, that may be used when no other cause codes apply. If M599 is used, the railroad must describe the events in a narrative. Furthermore, FRA relies on each railroad to self-report a description of the accident/incident, as well as the primary and contributing causes. Without an accurate description and identification of the causes, FRA personnel reviewing the report might not believe there is the potential that a second person could have helped prevent the accident/incident.

After RSAC failed to reach consensus, FRA conducted additional accident/incident data searches in an effort to determine whether there were any trends

that could be identified. FRA looked at whether any data might have suggested a safety problem with MMA, which operated the train in the tragic Lac-Mégantic accident described earlier, or with any problems with shortline railroads that were similar in size to MMA. Rather than compare MMA to the entire railroad industry which could provide a distorted result (as just a few accidents on a shortline might make it look like it has a high accident rate compared to a major railroad that operates many more miles over the course of a year), FRA compared MMA to its shortline peers. In 2012, the last full year before the accident, MMA had about 160,000 total miles. FRA reviewed its accident/incident database from 2003 through April 2014 and compared MMA to the 52 other railroads that had total miles in 2012 of between 100,000 and 200,000. FRA also looked at the data to see if it could determine the number of accidents for each of these shortlines, with and without one-person crews. For the one-person crews, FRA was able to isolate train accidents where hazardous materials were in the train, and eliminate remote control operations and any operation that occurred on yard track.

The data concerning MMA and its shortline peers revealed that nearly half of the 52 shortlines (25, or 48 percent) had at least one accident where hazardous materials were in the train, but that MMA had the worst record in this category. MMA had 18 accidents, which was twice as many as its closest shortline peer. MMA's 18 accidents accounted for 23 percent of the 78 total number of accidents in its shortline peer group where hazardous materials were in the train. Although only 4 of these 78 accidents/incidents occurred with a one-person crew (about 5 percent), 2 of the 4 occurred on MMA. Looking at all one-person crew train accidents in which a MMA shortline railroad peer

reported the cause to be a human factor failure, MMA reported no such accidents and 9 of MMA's shortline peers reported a total of 13. Consequently, while it can be determined that the two MMA one-person crew accidents involving hazardous materials in the train were not reported by MMA to be caused by a human factor failure, the data suggests that MMA stood out as having significantly more accidents involving trains carrying hazardous materials than its peers.

When looking at all train accidents in which a MMA shortline railroad peer reported the cause to be a human factor failure, MMA reported four such accidents, 4 of MMA's shortline peers also reported 4 such accidents, 13 of MMA's shortline peers reported more than 4 such accidents, and 39 of MMA's shortline peers, including MMA, reported a total of 153 human factor failure caused accidents. Including MMA, over 70 percent of MMA's shortline peers had at least one train accident caused by human factor failure, and 25 percent had more human factor failure train accidents than MMA. Thus, MMA did not stand out among its peers as having a much higher number of accidents attributed to human factor failure. FRA believes that even in cases where problematic one-person train operations cannot be identified by their number of past human factor accidents, FRA would be able to identify such operations with other information including inspection reports, and the railroad's description of operations and contingency plans to evaluate the safety culture and overall emergency preparedness to handle one-person operations.

If FRA were only to focus on the one-person crew safety data prior to the Lac-Mégantic accident, it would have been difficult to make the case that MMA did not have

a good enough safety record to operate one-person train crews as MMA did not have any accidents/incidents that it attributed to human factor failure of the one-person train crew. It also only had 2 one-person crew accidents involving hazardous materials in the train over the more than 10-year period analyzed. However, if this NPRM is finalized, FRA could use the data suggesting MMA had significantly more accidents involving trains carrying hazardous materials than its peers to have MMA address safety issues to reduce the overall high number of accidents before providing FRA approval of the continuance of a one-person train operation or approval for a new one-person operation. See 49 CFR 218.133 and 218.135.

Furthermore, this is an example of when the limitations of FRA's safety data would not help make a direct case that one-person operations are less safe than multiperson train crews but may still provide some possible basis for this proposed rule. That is, FRA's safety data suggests that a particular railroad that has a higher rate of train accidents where hazardous materials are in the train could find itself more likely to continue that trend regardless of the size of the crew, assuming the railroad takes no action to further prevent such accidents from occurring. And if such accidents were to eventually occur, FRA has found that multiperson train crews are better equipped to protect each other, other railroad workers, railroad equipment, the environment, and the general public, because they have more options available to them for taking mitigation measures than a single crewmember. Thus, a derailment might occur, regardless of the number of train crewmembers, but it might be the actions of the train crew post-accident that determine the severity of the damages or injuries that result. This may be especially

so when hazardous materials are present in the train or are in other trains operating on the same or adjacent track.

While data and information about one-person operations around the world are limited, evidence found by FRA and explained in the Regulatory Impact Analysis (RIA) that accompanies this rulemaking indicates that the safety records of these foreign operations are acceptable. FRA also found that most of these foreign operations would meet the requirements in one of the exceptions of the proposed rule (due to their size), and that most foreign governments have a role in the implementation of one-person crews (where they exist). Another factor to consider is that railroad workers in other countries have a more predictable work schedule, fewer working hours per week, and more opportunities to rest. See RIA Table 4. Nonetheless, FRA requests public comment on the lessons learned from these nations to implement one-person crews under a balanced regulatory oversight. Additionally, FRA requests public input about the safety performance of passenger and freight rail operations with less than two people in other countries. This is important because FRA could not find specific data on the safety records of international one-person crew passenger operations that do and do not meet the proposed exceptions.

Finally, railroads have achieved an improving safety record during a period in which the industry largely employed two-person train crews. FRA has no empirical evidence to suggest a causal relationship between these variables rather than a correlative one. In fact, it is possible that one-person crews have contributed to the improving safety record. Comparing calendar year 2004 to 2013, total accidents/incidents are down over

21.5 percent and human factor-caused train accidents/incidents are down over 50 percent. Over that same period, the number of reportable train accidents/ incidents has decreased from 3,385 in 2004 to 1,781 in 2013, a decrease of over 47 percent. The normalized frequency index of 2.380 per one million train miles for 2013 represents the safest year in that 10-year period, and is a decrease of nearly 46 percent from 2004. Meanwhile, it is impossible to keep data on how many accidents/incidents were prevented by having a properly trained two-person crew, where each crewmember understood each other's duties and together could perform as an expert team. Thus, although the limitations of the data collected make it difficult to make a straightforward finding that one-person operations are more or less safe than two-person operations, FRA's approval process in this NPRM is expected to provide some insight into exposing dangerous operations and lead to safety improvements for those railroads that want to reduce the number of train crewmembers to less than two.

#### **D. FRA's Regulations Were Designed for at Least Two Crewmembers**

During the Working Group's first meeting, FRA presented the agency's position that many of the Federal rail safety regulations were written with the expectation that each train would have multiple crewmembers. That does not mean that FRA expects that at least two crewmembers will be in the cab of the controlling locomotive at all times, which may surprise some people who are not familiar with a wide-variety of railroad operations. A typical freight locomotive is founded with the expectation that multiple crewmembers could be working in the cab of the controlling locomotive. However, there are many operating circumstances in which a second crewmember could more effectively

safeguard the operation by being somewhere other than the locomotive cab of the controlling locomotive and it would be difficult for a one-person train crew to perform the same operation. Because a railroad's operating rules and practices for a one-person operation will be a bit different than for multiple person train crews, some safeguards will be lost and new methods of operation will be developed to try and plug any regulatory holes. Without a crew size regulation, railroads would be free to jettison certain requirements that apply to multiple person crews without specifically being required to fully consider the potential safety repercussions. The following background explains some of the Federal rail safety requirements that will not work as intended when one-person train crews are deployed.

### **1. Difficulty Providing Point Protection for Shoving or Pushing Movements**

For shoving or pushing movements, a second crewmember routinely provides point protection where the controlling locomotive is the furthest car in the train from the leading end. See 49 CFR 218.99. In that case, a second crewmember riding the leading end or being on the ground in radio communication with the train's locomotive engineer may be the safest practice. A one-person train crew, operating any train of a significant length, may have difficulty determining that the track is clear for the shoving or pushing movement without the assistance of another person. Shoving blind, i.e., not protecting the movement, would violate the Federal rule.

Passenger and commuter locomotives do not always have room for a second crewmember in the locomotive control compartment, but a second person may still be necessary to provide assistance for shoving or pushing movements. Pushing or shoving

movements are routine operations and thus FRA's expectation is that few trains could perform these movements safely with only a one-person crew. We note, however, that the point protection rule permits use of cameras for performing these movements. See 49 CFR 218.99(b)(3)(i).

## **2. Complications Returning Switches to the Normal Position and Loss of Job Briefings**

In a typical multiple crewmember operation, the locomotive engineer would rarely be expected to leave the cab of the controlling locomotive to perform operational work. However, in a one-person operation, unless all switches can be operated from the locomotive or by a non-crewmember in accordance with a railroad's operating procedures, the locomotive engineer would encounter logistical difficulties in throwing some switches and then returning those switches and locking them in the normal position after use. See 49 CFR 218.103 through 218.107. If the one-person crew were to throw the switches and return them to the normal position, the person would need to walk back and forth the length of the train each time a switch was returned to the normal position.

The Federal regulations concerning throwing switches anticipate that the crewmembers will conduct job briefings "before work is begun, each time a work plan is changed, and at completion of the work." See, 49 CFR 218.103(b)(1). The regulation does not anticipate that a train crew consisting of one-person would be exempt from the job briefing requirements, although it seems absurd to think that any one-person train crews would need to hold job briefings with themselves. However, one of the most important benefits of a job briefing, with each crewmember's input, is potentially lost



when there is a one-person operation. That is, a lone crewmember cannot benefit from another crewmember's experience about the best way to safely perform the operation. Under routine operations, one-person crewmembers will decide for themselves how best to proceed. The one-person crewmember will also assess the factual circumstances of a situation by themselves, without the benefit of any additional crewmembers' observations. Although a railroad could implement procedures to address certain types of operations that can aid a one-person crew, such a briefing may not be able to duplicate all of the information that a fellow crewmember could.

### **3. Concerns Protecting Train Passengers in an Emergency**

During the first Working Group meeting, FRA made a presentation regarding FRA's passenger train emergency preparedness rule (49 CFR part 239) and explained how multiple train crewmembers are typically necessary in order to fulfill the purpose of the rule. The purpose of the passenger train emergency preparedness rule "is to reduce the magnitude and severity of casualties in railroad operations by ensuring that railroads involved in passenger train operations can effectively and efficiently manage passenger train emergencies." 49 CFR 239.1(a). There are numerous ways that crewmembers, other than the locomotive engineer, can assist the passengers in an emergency.

Emergencies can require evacuations in various types of circumstances where a trained person would be helpful to guide passengers away from danger. For example, passengers that self-evacuate might not realize that they could step on an electrified rail or be struck by a train approaching on an adjacent track. Evacuations in remote areas, in tunnels, or on bridges also pose significant dangers to passengers and are places where

crewmembers are required to be trained on safe methods to assist passengers. A one-person crew would have significant difficulty coordinating any type of evacuation, especially in difficult terrain, if the crewmember cannot walk from car to car, or if there are large numbers of passengers. Furthermore, although signs for train passengers can be useful, signs have limited value for reliably instructing passengers on when it is safe or unsafe to evacuate under all conditions.

#### **4. Deterrence of Electronic Device Distraction and Observing Alcohol or Drug Impairment; Reduced Possibility of Co-Worker Referrals**

Another issue that could be a concern with a one-person train crew is whether there is adequate supervision to determine that the person is not reporting for duty under the influence of or impaired by alcohol or drugs. With multiple train crewmembers, a second crewmember might suspect that a person has used, or is using or possessing alcohol or drugs on railroad property. Working with a potentially impaired co-worker is a safety hazard that puts other crewmembers in direct conflict with one another. For that reason, FRA has developed minimum standards for co-worker report policies that allow the employee suspected of abuse to get treatment and rehabilitation, with the potential to return to railroad safety-sensitive work under certain conditions. See 49 CFR 219.405 and 219.407 (permitting a railroad to implement an alternate co-worker policy with the written concurrence of the recognized representatives of a particular class or craft of covered employees). The co-worker referral policy makes it more palatable for an employee to turn in a potentially impaired co-worker, knowing that the co-worker will have an opportunity to get professional help without the co-worker necessarily losing his

or her job, and not having to work side-by-side with that impaired co-worker.

Although a one-person crew may be subject to pre-employment testing, random testing, and testing for cause, each of these types of tests do not apply to shortline railroads which have a total of 15 or fewer employees who are covered under the hours of service laws and do not operate on the tracks of any other U.S. railroad. Additionally, even if a one-person crew is potentially subject to each of those tests, the person will not be tested before, during, or after every tour of duty. Thus, a one-person crew has more opportunity, especially on the smallest shortline operations, to conceal a drug or alcohol violation, than the person would if there were two or more crewmembers.

Similarly, without a second crewmember to monitor the sole crewmember's attentiveness, there is a risk that more locomotive engineers will be tempted to use cell phones and other prohibited electronic devices when nobody is around to observe them. When FRA issued a final rule restricting railroad operating employees from using cellular telephones and other electronic devices, FRA noted that distracted driving impacts all transportation modes because these devices have become ubiquitous in American society. See 75 FR 59580, 59582, Sep. 27, 2010, promulgated at 49 CFR part 220, subpart C. In the justification for the rulemaking, FRA stated that it discovered numerous examples of the dangers posed by distracting electronic devices and described five rail accidents indicating the necessity for the restrictions. FRA's electronic device distraction rulemaking also stated that "it is difficult to identify distraction and its role in a crash" if it goes unreported by the operator of the vehicle. 75 FR at 59582 (describing how data on the number of motorcoach crashes may potentially understate the true size of the

problem because “self-reporting of negative behavior, such as distracted driving, is likely lower than actual occurrence of that behavior). Thus, a second crewmember could act as both a deterrent to any crewmembers using electronic devices in a prohibited manner and as a witness reporting such inappropriate electronic device usage during an accident/incident investigation.

### **5. Complicating Radio Communication Procedures**

Some radio and wireless communication requirements were written with the expectation that there would be at least two crewmembers on a train. For example, FRA requires that an employee copying a mandatory directive received by radio transmission shall not be an employee operating the controls of moving equipment. See 49 CFR 220.61. Copying a mandatory directive would clearly be distracting to a person who was attempting to operate a train simultaneously, which explains why it is strictly prohibited. Certainly, a one-person train crew could stop a train to receive a mandatory directive by radio, but there is a question whether railroads have thought through all the safety implications of stopping the train. The train may be going at a high enough speed that it would take over a mile to stop the train, or the train might be in a territory where a steep grade or other physical conditions make stopping the train logistically difficult. One would hope that the mandatory directive would not impact the train operation immediately before the one-person crew could safely stop the train to receive the transmission.

The different ways a multiple person crew can handle a radio communication failure also is indicative of how an FRA regulation was written with the expectation that

there would be more than one train crewmember. Under most circumstances, FRA's railroad communication regulation requires a train to have a working radio in each occupied controlling locomotive, and in a second locomotive for purposes of "communication redundancy." 49 CFR 220.9. If the controlling locomotive's radio fails en route, the crewmembers have the back-up radio in the second locomotive to use to avoid a radio blackout.

Trains with multiple crewmembers have an option not available to one-person crews. In cases of radio malfunction, it may be necessary to have a crewmember located in the second locomotive to monitor the dispatcher's communications as long as the crewmembers can otherwise communicate while the train is moving. However, if the train was a one-person operation, the lone crewmember would certainly not be able to operate from a locomotive not on the leading end, so the one-person crew would have to either try and swap out the locomotives so that the one on the leading end had a working radio to communicate with the dispatcher, or the one-person crew would need to find a way to notify the dispatcher as soon as practicable that radio communication has been lost. 49 CFR 220.38. With a multiple person operation, swapping the locomotives would likely involve a crewmember getting off the train and lining switches. Swapping the locomotives could be logistically difficult for a one-person crew depending on the track configurations encountered and the method of operation. Although a one-person crew could operate the train without a working radio to the nearest forward point where the radio can be repaired or replaced, doing so is not as safe an option as utilizing the redundant communication in the second locomotive with a working radio – an option

more likely to be utilized with a multiple-person train crew.

## **6. Adding a Potential Safety Hazard to Highway-Rail Grade Crossing**

### **Activation Failures**

The general public is directly impacted when a highway-rail grade crossing fails to activate because that means motor vehicle traffic would not receive any warning of an approaching train. Protecting the public is paramount to train operation, and FRA requires that a train can only proceed through the crossing when other steps are taken to protect highway users from approaching trains. 49 CFR 234.105. If a railroad has enough time to arrange for an equipped flagger or a uniformed law enforcement officer to be at the crossing, then the train may proceed through the crossing without stopping, albeit at potentially a slower than normal speed depending on the number of flaggers/officers. However, if a railroad does not have enough time to make other arrangements, the only other method that will allow the train to proceed through the crossing is if the train stops prior to entering the crossing in order to permit a crewmember to dismount to flag highway traffic to a stop. The flagging crewmember is not allowed to reboard the train until the locomotive has completed its procession through the crossing. Hence, under FRA's regulations, a one-person crew could not stop and flag the crossing without a non-crewmember flagger or a uniformed law enforcement officer's assistance.

Certainly, a railroad's on-time efficiency would be negatively impacted by the activation failure because a train with a one-person crew would have no choice but to wait until a flagger or officer arrived before proceeding through the crossing. Depending

on the circumstances, the general public might also be negatively impacted. For example, if the train was forced to stop in a highly populated area, nearby citizens and businesses might be inconvenienced by the locomotive engine noise or exhaust fumes. Another concern is whether the train stopped clear of all other crossings. Highway users and local emergency responders may be significantly inconvenienced if the railroad and one-person train crew were unable to plan a safe place to stop the train without blocking other grade crossings. Planning a safe place to stop the train is typically considered a conductor's job, but with only one crewmember the one-person crew has no one else to help. Motor vehicle drivers or local emergency responders would not be given any advance warning of the blocked crossing or any information regarding when the crossing would no longer be blocked. Such poor planning can infuriate motor vehicle drivers and lead these drivers to take risks not to get caught waiting for a train the next time they see a grade crossing warning system begin to activate. In some cases, such poor planning could compromise the ability of local emergency services to respond. Thus, there is the potential for immediate and future repercussions when there is only a one-person train crew and no ability to quickly flag the crossing.

#### **E. Defining the Crewmembers' Qualifications**

In this proposed rule, FRA chose not to define the duties of the two mandatory crewmembers. FRA previously fulfilled its statutory obligations to promulgate regulations requiring certain minimum standards for locomotive engineers and conductors. 49 U.S.C. 20135 and 20163 and 49 CFR parts 240 and 242. FRA believes that each locomotive or train must have a crew that can perform all of the duties

described by the qualifications requirements in the certification regulations for these two operating crewmembers. This can be accomplished with the assistance of technology and sometimes with the assistance of one or more other safety-related railroad employees who are not recognized by the railroad as the train's conductor. In this background, FRA will reiterate the regulatory requirements, focusing on the existing limitations and acknowledging FRA's policy. This issue is raised because FRA may consider adding requirements in the final rule specifying minimum requirements for a second crewmember's qualifications, in the event that person is not a qualified conductor. There is a question of whether the rule might need to define the duties of a freight train second crewmember who is not a conductor differently from the duties of a passenger train second crewmember.

Nearly every movement of a locomotive, whether or not the locomotive is coupled to other rolling equipment, requires that the operation be performed by a certified locomotive engineer. 49 CFR 240.7 (defining "locomotive engineer" and allowing exceptions for movements of locomotives: (1) within a locomotive repair or servicing area and (2) of less than 100 feet for inspection or maintenance purposes). Until technology is developed that might allow for the safe operation of locomotives or trains completely by computer automation, a person is needed to operate the locomotive or train, and that person is required to be certified pursuant to FRA's locomotive engineer regulation. The issue of whether a one-person crew can operate safely is mainly an expansion of the role of a locomotive engineer to include some or all of the duties of a conductor, sometimes with the assistance of technology and sometimes with the



assistance of one or more other safety-related railroad employees who are not recognized by the railroad as the train's conductor.

In the conductor certification final rulemaking, FRA recognized that there may be circumstances where a person is “serving as both the conductor and the engineer.” 76 FR 69802, 69809, Nov. 9, 2011 (explaining that a person may hold both a locomotive engineer certification and a conductor certification, and establishing rules for when revocation of each certification is appropriate under 49 CFR 242.213). In doing so, FRA recognized the realities of remotely controlled locomotive and train operations which often involve yard or yard-type operations, travel to and from yards, or travel to service customers, without a second crewmember being present. See 49 CFR 242.213(d). Similarly, FRA permits a certified conductor attached to a train crew in a manner similar to that of an independent assignment when a certified conductor is not accompanying a locomotive engineer or the engineer is not dual conductor/engineer certified. However, FRA expressly noted in the NPRM that the “conductor certification regulation, including section 242.213, be neutral on the crew consist issue [and that] [n]othing in . . . part 242 should be read as FRA’s endorsement of any particular crew consist arrangement.” 76 FR 69166, 69179, Nov. 10, 2010. This disclaimer was made to facilitate industry-wide discussion on the conductor certification rulemaking and foster a potential consensus recommendation from FRA’s Federal advisory committee, without the conductor rule becoming a referendum on the issue of crew size. Thus, although portions of the conductor rule could be read to suggest FRA acceptance of a variety of one-person crew operations, FRA’s explicit disclaimer shows that the agency did not intend for the

conductor rule to be that sort of proclamation.

FRA's foremost concern is that a passenger railroad will have one person in the crew who is dual certified as both a locomotive engineer and a conductor, but a second person may be lacking many of the relevant qualifications normally associated with a passenger conductor. If a second passenger train crewmember lacks too many of the qualifications of a conductor, the second person may not be truly helpful in emergency situations or even routine rail operations. The potential for creating foreseen and unforeseen problems with using a second passenger crewmember who is not conductor qualified is disconcerting. For these reasons, FRA encourages interested parties to comment on whether FRA should address this issue in the final rule. For example, FRA suggests that a second passenger crewmember who is not a conductor should be qualified on: (1) the signals to be encountered, including the name and possible indications; (2) the physical characteristics of the territory to be operated over; (3) flagging; (4) railroad operating rules (49 CFR part 218); (5) railroad radio and communications rules (49 CFR part 220); (6) passenger equipment safety standards (49 CFR part 238); and, (7) passenger train emergency preparedness (49 CFR part 239). Currently, FRA has enforced a safe course through the approval process requirement in the passenger train emergency preparedness rule. 49 CFR 239.201. Although FRA may continue to use the emergency preparedness approval process in this manner, the passenger railroad industry or public might benefit from a clear set of requirements for the qualification of a second train crewmember.

FRA has similar concerns about a second freight train crewmember who is not a

certified conductor. A railroad might employ a brakeman or other operating crewmember who lacks the versatility of a conductor, which could raise questions regarding the safety of such a two-person operation. Similar operational questions could arise with the use of a person who is more like a utility employee (see 49 CFR 218.22) than a crewmember who is assigned to a train. There are certainly some duties that a utility employee can perform for a train crew that would typically be classified as the responsibility of a freight conductor. However, because the utility employee is neither in the locomotive cab with the locomotive engineer or in near constant radio communication with the locomotive engineer while the train is moving, the utility employee cannot be deemed a replacement for all of the conductor's duties and benefits. In order to address safety concerns with the use of a second crewmember who is not a certified conductor, FRA seeks comments on whether the final rule should identify specific minimum qualifications for freight train crewmembers that lack all of the qualifications of a conductor. Minimum requirements for a second freight train crewmember who is not a certified conductor might include: (1) knowledge of railroad rules and safety instructions; (2) railroad operating rules particular to handling equipment, switches, and fixed derails (49 CFR part 218, subpart F); (3) railroad radio and communications rules (49 CFR part 220); and, (4) brake system safety for freight trains and equipment, including end-of-train devices (49 CFR part 232).

FRA requests public comment on how railroad operations can and do safely and efficiently comply with these regulations with one-person crews or autonomous trains. Are there particular operational contexts in which compliance using one-person crews is

particularly difficult or poses greater safety risks? What risk mitigating measures will railroads use to safely and efficiently comply with these regulations using one-person crews? Should any of these regulations be revised to allow one-person crews to operate safely and efficiently?

### **III. RSAC Overview**

In March 1996, FRA established the Railroad Safety Advisory Committee (RSAC), which provides 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. A list of RSAC members follows:

American Association of Private Railroad Car Owners (AARPCO);

American Association of State Highway & Transportation Officials (AASHTO);

American Chemistry Council;

American Petroleum Institute;

American Public Transportation Association (APTA);

American Short Line and Regional Railroad Association (ASLRRA);

American Train Dispatchers Association (ATDA);

Association of American Railroads (AAR);

Association of State Rail Safety Managers (ASRSM);

Association of Tourist Railroads and Railway Museums (ATRRM);

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;

Institute of Makers of Explosives;

International Association of Machinists and Aerospace Workers;

International Brotherhood of Electrical Workers (IBEW);

Labor Council for Latin American Advancement (LCLAA);\*

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 (NRC);

National Railroad Passenger Corporation (Amtrak);

National Transportation Safety Board (NTSB);\*

Railway Passenger Car Alliance (RPCA)

Railway Supply Institute (RSI);

Safe Travel America (STA);

Secretaria de Comunicaciones y Transporte;\*

SMART Transportation Division (SMART TD)

Transport Canada;\*

Transport Workers Union of America (TWU);

Transportation Communications International Union/Brotherhood of  
Railway Carmen (TCIU/BRC);

Transportation Security Administration (TSA).

\*Indicates associate, non-voting membership.

When appropriate, FRA assigns a task to RSAC, and after consideration and debate, RSAC may accept or reject the task. If accepted, RSAC establishes a working group that possesses the appropriate expertise and representation of interests to develop recommendations to FRA for action on the task. These recommendations are developed by consensus. The working group may establish one or more task forces or other subgroups to develop facts and options on a particular aspect of a given task. The task force, or other subgroup, reports to the working group. If a working group comes to consensus on recommendations for action, the package is presented to RSAC for a vote. If the proposal is accepted by a simple majority of RSAC, the proposal is formally recommended to FRA. FRA then determines what action to take on the recommendation. Because FRA staff play an active role at the working group level in discussing the issues and options and in drafting the language of the consensus proposal, and because the RSAC recommendation constitutes the consensus of some of the industry's leading experts on a given subject, FRA is often favorably inclined toward the RSAC recommendation. However, FRA is in no way bound to follow the recommendation and the agency exercises its independent judgment on whether the recommended rule achieves the agency's regulatory goals, is soundly supported, and is in accordance with applicable policy and legal requirements. Often, FRA varies in some respects from the

RSAC recommendation in developing the actual regulatory proposal or final rule. Any such variations would be noted and explained in the rulemaking document issued by FRA. If the working group or RSAC is unable to reach consensus on recommendations for action, FRA resolves the issue(s) through traditional rulemaking proceedings or other action.

#### **IV. No Recommendation From the RSAC Working Group**

On August 29, 2013, the RSAC accepted a task (No. 13-05) entitled “Appropriate Train Crew Size.” The statement clarified that “[i]n light of the recent Canadian train incident and the subsequent emergency directive issued by Transport Canada, FRA believes it is appropriate to review whether train crew staffing practices affect railroad safety.” FRA identified four purposes of this task, which were all variations on requests for RSAC to evaluate whether and how crew redundancy affects railroad safety and when crew redundancy should be deemed necessary. Crew redundancy is the idea that a second crewmember can confirm for the locomotive engineer important information thereby providing a second layer of assurance that the train is being operated in accordance with all applicable rules, procedures, practices, restrictions, and signal indications. However, the second crewmember’s responsibilities are not just passive in a confirming way. The second crewmember can provide redundancy by taking the lead on tasks that free the locomotive engineer to focus on the engineer’s core role of train handling.

The task statement specified that RSAC was expected to look at a list of FRA rail safety regulations to evaluate whether and how crew size impacts rail safety. The

statement also asked RSAC to review published studies and reports, as appropriate. FRA provided the five FRA-sponsored studies, as well as the one TRB conference report, each of which were described previously in this preamble. In reviewing these materials, FRA was hoping that RSAC would be able to address the following issues in its recommendations report:

- Report on whether there is a safety benefit or detriment from crew redundancy, including an analysis of observed safety data and outcomes from current crew deployment practices.
- Review existing regulations and consider the impact of crew size on the performance of any task or activity.
- Report on the costs and benefits associated with crew redundancy.
- If appropriate, develop recommended regulatory language or guidance documents regarding crew size requirements that enhance the safety of railroad operations by providing enhanced regulatory redundancy. In considering the development of regulatory language, specifically consider the value of regulatory redundancy in terms of crew size as it relates to trains or vehicles identified by the group responsible for Task Number 13-02 (i.e., an RSAC task to identify types and quantities of hazardous materials for special handling as a result of reviewing the Lac-Mégantic accident) as requiring special handling and/or operational controls, and if appropriate develop recommended regulatory language specific to these railroad operations.

Furthermore, in order to accommodate some RSAC members, RSAC agreed to



consider other issues that have some arguable connection to the crew size issue. These other issues were to consider (1) the appropriate role and impact of technological advances on crew size and crew deployment and incorporate these into any recommendation developed, (2) PTC and Remote Control Operations or other operations where crew deployment practices or the use of technology may enhance the safety of operations, and (3) the application of a System Safety Program to these issues.

In addition to FRA, the following organizations contributed members:

APTA, including members Capital Metropolitan Transportation Authority (CMTA), Keolis North America, Long Island Rail Road (LIRR), Massachusetts Bay Commuter Railroad Company (MBCR), Metro-North Railroad (MNCW), North County Transit District (NCTD), Regional Transportation District (RTD), and San Joaquin Regional Rail Commission;

- ASLRRRA, including members from Central California Traction Company (CCT), Farmrail System (FMRC), Genesee & Wyoming Inc. (GNWR), Indiana Rail Road Company (INRD), OmniTRAX, Pinsky Railroad Company, and WATCO Companies, Inc. (WATCO);
- ASRSM, including members from the California Public Utilities Commission (CPUC);
- ATDA;
- ATRRM
- BLET;

- BMWED;
- BRS;
- NRC, including members from Herzog Transit Services (Herzog);
- SMART TD;
- TCIU/BRC; and
- TWU.

The Working Group convened five times on the following dates in Washington, DC. Minutes of each of these meetings are part of the docket in this proceeding and are available for public inspection.

- October 29, 2013
- December 18, 2013
- January 29, 2014
- March 5, 2014
- March 31, 2014

As the Working Group meeting notes in the docket reflect, FRA started the first meeting by providing an overview of FRA's position on the crew size issue. Although FRA always enters any RSAC discussion with an agency position on the issue being discussed, FRA was quicker than in previous RSAC discussions to reveal its broad-based positions. Typically, FRA will start the first meeting with a free-form discussion of the topic, allowing the RSAC Working Group's members to brainstorm problems and a range of acceptable solutions. The typical approach works well when FRA is unsure of whether a regulation is necessary, there already is an informal consensus that action needs to be taken, or the Working Group knows FRA will regulate the issue because there is a statute mandating promulgation of a regulation. None of these scenarios were

present with the crew size issue. For these reasons, FRA believed it needed to approach this RSAC differently by defining its broad position on appropriate train crew size at the beginning of the first meeting.

During that first RSAC Working Group meeting, FRA presented some background on the crew size issue. FRA acknowledged that it had not previously felt the need to talk about crew size until recently for several reasons. Historically, crew size has been an issue for labor relations, and technology has enabled a gradual reduction in the number of train crewmembers from about five in the 1960s to two in 2014. Four major technological breakthroughs were mentioned in FRA's presentation that led to the historic train crew size reductions: (1) the phase out of steam locomotives allowed locomotives to be operated without crew known as fireman dedicated to keeping the engine fed with coal, (2) the introduction of portable radios made it easier to transmit information from a crewmember at the far end of the train to the leading end, (3) the end-of-train device replaced the need for one or more crewmembers to be at the rear of a train on a caboose to monitor brake pipe pressure, and (4) the development of improved train control devices helped automate safer operations in case of human error. Furthermore, FRA raised another significant technological innovation that has become widespread over the last 20 years; that is, remotely controlled locomotive operations utilizing only a one-person crew for switching service have become commonplace.

FRA told the Working Group that the agency's position on appropriate crew size is that: (1) railroad safety is enhanced through the use of multiple crewmembers, (2) it is difficult to comply with current safety regulations and operating rules when operating

with a one-person crew, (3) FRA's safety regulations were written with at least a two-person crew in mind and that operating with a one-person crew may, in some cases, compromise railroad and public safety, and (4) a second crewmember provides safety redundancy and provides a method of checks and balances on train operations. For all these reasons, FRA took the position that it needs to have some oversight of train crew size so that it can protect railroad employees and the general public.

FRA then explained its broad position on establishing train crew size requirements, explaining that the agency wanted the Working Group to make recommendations that would establish safe practices for both two-person train operations and those with less than two-persons. For instance, FRA took the negotiating position that the Working Group should develop a recommendation with a baseline of a minimum two-person crew for freight and passenger trains. The Working Group was told that FRA wanted to hear about current one-person crew operations that have been safely conducted so that those exceptions to a two-person standard could be carved out in the RSAC's recommendations. FRA also expressed an interest in offering to provide for a special approval process in a crew size regulation that would allow FRA to quickly and efficiently provide review and approval of any train crew arrangement that could not meet any easy to define specific exclusions. In order to ensure reasonable oversight, FRA suggested that a special approval would be granted based on whether the railroad's petition demonstrated an appropriate level of safety based on a combination of safeguards offered by shoring up operating procedures and implementing proven technologies. FRA noted that this was a generous compromise position, as FRA was not taking an absolute

position that all trains must be operated with a two-person crew because it has the expertise to recognize accepted safe practices.

FRA's broadly stated negotiating position at the Working Group meetings was also constructed based on feedback recently received from two railroad associations participating as RSAC members. In response to Emergency Order 28, which was issued after the Lac-Mégantic accident, AAR reported to FRA that "Class I railroads currently use two-person crews for over-the-road mainline operations."<sup>3</sup> AAR was certainly looking to assure FRA that the major railroads were not conducting one-person trains transporting the types and quantities of hazardous materials specified in appendix A of Emergency Order 28. ASLRRA could not be specific about each of its members' policies on transporting hazardous materials with one-person crews. However, ASLRRA tried to assure FRA that its members had "carefully consider[ed] the appropriate train and engine crew assignments to assure the highest degree of safety for the movements they operate."<sup>4</sup> Taking the AAR and ASLRRA's comments at face value, FRA did not believe the agency's initial negotiating position differed greatly from the status quo. That is, the major railroads were already using two-person train crews for over-the-road mainline operations and the shortlines were carefully considering safety, presumably

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<sup>3</sup> Letter from Mr. Edward R. Hamberger, President and CEO of AAR, to Mr. Joseph C. Szabo, FRA Administrator (Oct. 16, 2013), which has been placed in the docket to this rulemaking.

<sup>4</sup> Letter from Mr. Richard F. Timmons, President of ASLRRA, to Mr. Joseph C. Szabo, FRA Administrator (Oct. 17, 2013), which has been placed in the docket to this rulemaking.

through a safety analysis of each operation prior to implementation – or so that was intimated.

Despite the AAR and ASLRRA's publicly stated positions on crew size, it was clear from the first meeting that the members of these associations were opposed to RSAC making any recommendation that provided FRA with oversight on crew size issues. AAR stated at that first meeting that there is no safety justification for FRA to address train crew size. ASLRRA took the position that because there have been very few, if any, accidents involving a one-person crew, and management has been very responsible regarding crew size, that FRA should not dictate safety regulations on the subject. FRA interpreted that unwillingness as an indication that the industry does not intend to maintain the status quo. Thus, FRA believes it cannot rely on the assurances made in the associations' written pronouncements.

As more Working Group meetings were held, FRA became increasingly concerned about the extent of one-person train operations in the U.S. and the extent that these operations may have proliferated without FRA oversight of them. Based on discussions with the railroad members of the Working Group, there appears to be a trend that more railroads of every class are willing to experiment with one-person train crew operations. Members representing Labor organizations seemed as surprised as FRA with some of the generalized statements made by a variety of railroads regarding the extent of the existing one-person operations. For example, railroads of all classes seemingly have permitted remote control operations with only one-person to routinely operate on main track in limited train service, as opposed to being used for switching service – the original

expected use for which the technology was designed. AAR and ASLRRA were unwilling to recommend FRA oversight of their members to assure railroad employees and the general public that their members' existing operations are safe, proclaiming that the lack of safety data showing there was an existing problem should prevail as an argument.

Without a requirement for railroads to consult FRA on questionable crew size practices, FRA did not field inquiries from railroads asking for the agency's opinion on the safety of the practices. Even if an FRA inspector were to observe a train being operated with only one-person, FRA personnel would not have any reason to write up an inspection report detailing the finding – unless the one-person operation was alleged to have violated an FRA safety law, regulation, or order and the issue was tangentially raised in the report. Certainly, high level safety personnel at FRA were unaware of how many railroads, especially freight railroads, were regularly fielding trains with only a one-person crew. For these reasons, the Working Group's discussions of existing one-person train crew operations were illuminating.

Just as railroads have explained for over a century that certain operating rules were "written in blood" because it took one or more accidents causing serious injuries or fatalities before the operating rule was written, railroad employees and the general public should not have to wait for horrific accidents before the Federal government takes action. FRA provided the Working Group with a number of significant reasons for recommending regulatory action. In summary, FRA provided: (1) the scientific research studies showing the benefits of a second crewmember, (2) the anecdotal information

regarding recent train accidents and how a second crewmember either could have played a safety role or did play such a role,(3) the explanation that FRA's railroad safety regulations were written with the expectation that nearly every train would be operated by no fewer than two crewmembers, and (4) the general public's negative reaction to the idea that FRA did not already mandate two-person train crews to add another layer of safety.

During the Working Group's first meeting, SMART-TD stated its belief that FRA appears to be responding to the public's demand for action. SMART-TD backed up its statement during the Working Group's January 29, 2014, meeting when it shared a research report it sponsored that combined data from five surveys that indicated a strong level of bipartisan support among voters for a Federal law requiring freight trains to operate with a crew of two. The surveys were conducted in the States of Kentucky and North Dakota, and in select Congressional districts in the States of Colorado, Kansas, Iowa, and Pennsylvania. The data supported a finding that 77 percent of all respondents support Federal legislation requiring freight trains to be operated by a crew of two. Even when respondents were not reminded in a prior question about recent deadly train accidents in Quebec, Spain, and New York City, 74 percent supported Federal legislation. Another finding was that an overwhelming majority of those polled (between 83 to 87 percent in each of the five surveys) had the opinion that, generally speaking, when it comes to railroad safety and operations, one operator cannot be as safe as a train with a crew of two individuals. A copy of this report has been placed in the docket.

Despite the early warning signs that the Working Group would not be able to



reach a consensus, FRA held 5 day-long meetings spread out over 6 months in which the agency continued to make substantive presentations and negotiate in good faith. Every time APTA or ASLRRRA presented a new set of facts for a potential exception, FRA listened and came back with a written recommendation that tried to capture the request for leniency. Twice, AAR provided the Working Group with a list of a variety of railroad operations that it claimed should be allowed to continue with one-person with no restrictions. Each time, FRA responded with a written recommendation that tried to capture the request for leniency or, in a few instances, explained why it could not support such a request. Although no consensus was reached during the Working Group meetings, there seemed to be a tacit understanding that FRA had adequately described each operation for which it included an exception in its working document.

First, at the January 29, 2014 meeting, AAR listed the following examples as non-revenue movements that it suggested should not require a minimum of two crewmembers: “(1) Helpers; (2) Pushers; (3) Light engines; (4) Passenger moves; (5) Hostlers; (6) Locomotive exchange crews; (7) Work trains; (8) Wreck crews; and (9) Roadway maintenance machines.” Final Minutes 2014 0129 TCWG-14-03-0503 pdf at 15. During the same meeting, AAR also asked whether FRA would agree to an exception for (10) interchange and transfer moves, (11) mine load out or plant dumping, and (12) toxic by inhalation or poisonous by inhalation (TIH/PIH) hand-offs, where one crewmember remains behind to facilitate secure hand-off, a Transportation Security Administration (TSA) requirement. FRA agreed, and altered its Working Group proposal to include an exception for each of the twelve items with the following caveats: (1) FRA

did not believe a special exception was necessary for pushers, as the exception for helpers also covers pushers; (2) FRA provided an exception for light/lite engines, but made clear that the exception did not apply to passenger diesel or electric multiple unit (DMU or EMU) operations; (3) FRA provided an exception for hostlers conducting switching operations, but not hostlers working in other than switching operations; (4) FRA considers a wreck crew to be a work train, and FRA provided an exception for work trains; (5) FRA's work train exception applies to roadway maintenance machines in a work train, but such machines are not otherwise excepted; (6) FRA did not except interchange/transfer train movements as these operations, which may travel up to 20 miles while picking up or delivering freight equipment under the definition of "transfer train" in 49 CFR 232.5, pose the same safety issues as other trains that are not limited to traveling 20 miles; and (7) during a TIH/PIH hand-off, FRA did not create an exception that would allow the second crewmember to be left behind with the PIH/TIH car while the train departed with only a one-person crew as the train continuing would pose the same safety issues as other trains.

Second, in anticipation of the final Working Group meeting held on March 31, 2014, AAR submitted a document on March 28, 2014, titled "Discussion of Current Class I Operations Using Vehicles When Assisting Trains." AAR Discussion Document TCWG-14-03-31-04.pdf. The document describes six situations where a second train crewmember would need to be located outside of the operating cab of the controlling locomotive when the train is moving in order to continue to perform the duties assigned, and then lists seven additional examples. The second train crewmember would then need

another way to catch up to the train to get back on it. FRA believes all of the operations described in that AAR document are acceptable, as long as the second train crewmember that is separated from the train can directly communicate with the crewmember in the cab of the controlling locomotive pursuant to proposed 49 CFR 218.125(d). FRA has greatly benefited from the open, informed exchange of information during the meetings.

Although the Working Group did not reach consensus on any recommendations, FRA decided not to extend the April 1, 2014, deadline that FRA initially presented the RSAC. FRA did not think it would be beneficial to continue to discuss with the RSAC's railroad members the issue of what data FRA had to support this rulemaking recommendation when they knew full well that the data, supplied by the railroads themselves to FRA, does not capture accidents where the cause or contributing factor was lack of a second crewmember.

It was also made clear to FRA that organizations representing railroad employees supported FRA's overall concept of mandating two-person crews on each train with some exceptions, but were overwhelmingly opposed to FRA's draft rulemaking recommendation that attempted to greatly accommodate all classes of passenger and freight railroads. Several labor organizations wanted FRA to scale back some of the exceptions FRA accepted as part of the agency's attempt to reach a consensus. For example, these organizations wanted to limit the shortline railroad exceptions in 49 CFR 218.131(a) to a freight train operated on a railroad and by an employee of a railroad with 15 or fewer employees, rather than the FRA position of "a freight train operated on a railroad and by an employee of a railroad with less than 400,000 total employee work

hours annually” (which is the equivalent of about 200 or fewer employees). Labor organizations also expressed a preference for requiring each railroad to petition for a waiver to utilize less than two train crewmembers rather than recommend a special approval procedure that would propose a much shorter FRA review period. Thus, after five meetings, with labor and management representatives taking polar opposite positions on large and small issues, FRA decided not to accept some Working Group members’ recommendation to extend the deadline for negotiating a recommendation.

## **V. FRA’s Overall Post-RSAC Approach**

This proposed rule offers a pragmatic approach to providing oversight of the crew size of non-switching train services to ensure the continued safety of railroad employees and the general public. In that respect, FRA’s approach to the crew size issue has remained the same as when the agency first brought its position to the Working Group’s attention. FRA views its crew size concerns as a relatively small current problem that has the potential to balloon into a much greater problem in the not-too-distant future if appropriate oversight is not exercised. Because there is significant potential for this safety issue to become a much greater problem in the second half of this decade, FRA believes the time to act is now.

### **A. The Proposal is Largely Focused on Influencing How Railroads Approach Future One-Person Operations**

Based on information orally provided by AAR regarding the major railroads current train crew size practices, it appears that the proposed rule would not have a substantial impact on the current operation of the major railroads. Each major railroad

appears more concerned about how a crew size regulation would impact the railroad's possible future plans to reduce train crew size to less than the general current industry standard of at least two crewmembers. It appears that the major railroads and some passenger railroads are eager to use PTC alone, or with other technologies, to reduce train crew size to one person. There is also an undercurrent of views that supports the idea that one day the major railroads could have "drone" locomotives, operated by one person or even by computer that could allow operation of a locomotive or train from a location that is miles away from the actual train movement. The railroads appear to prefer that FRA does not regulate the safety of train operations by mandating a minimum train crew size and establishing an FRA approval process so they can potentially consider piloting use of less than one-person crews in additional operations. Without this proposed rule, FRA has only narrow authority to take action – mainly exercised through the agency's emergency order authority after a serious accident or in FRA's review of a passenger operation's emergency preparedness plan. FRA's current approach, without a crew size requirement, permits railroads to have the ability to reduce the number of crewmembers on any train operation without necessarily performing any safety analysis or allowing FRA the opportunity to review whether the railroad has considered the safety implications of the operation or implementing any off-setting actions that FRA believes are necessary.

FRA expects that the two-person aspect of the crew size rule would also not have much of an impact on current passenger train operations. It is rare for passenger train operations to have less than a two-person crew, largely because emergency preparedness plans would be ineffectual without at least two persons to execute it. Like the major

railroads, some passenger railroads will oppose this proposed rule largely because it restricts a railroad's unilateral ability to reduce train crew size in the event it can automate ticket sales and eliminate the need for assisting passengers. As with the major freight railroads, FRA is concerned that passenger railroads will focus on the economic benefit of not having to pay for a second crewmember without considering all of the safety benefits of having a second crewmember. FRA certainly believes its oversight of passenger train safety is warranted to protect the general public and any railroad employees that potentially could be impacted by the decision to reduce current train crew staffs.

During the Working Group meetings, ASLRRA indicated that the current operations of shortline railroads would be greatly impacted by this rule because of the number of shortlines that utilize a one-person operation. However, survey information provided by ASLRRA does not suggest that a great many shortline railroads would be impacted by the proposed rule. At the January 29, 2014, RSAC Working Group meeting, ASLRRA presented findings from a survey the association conducted via its Regional Vice Presidents in December 2013. ASLRRA Single Person Operations Survey Findings TCWG-14-01-29-05.pdf. ASLRRA estimated that there are approximately 558 Class II and Class III railroads, 29 of 223 respondents (13.0 percent) run one-person crews at least part of the time, there are 13,468 annual one-person crew starts, one-person crews accumulated 481,936 miles of train operations, the longest distance operated by a one-person crew is 119 miles, the shortest distance operated by a one-person crew is 0.33 miles, and the average mileage per crew start is 35.8 miles. Thus, according to

ASLRRA's data, only about 13 of every 100 shortlines run any type of one-person operation. Certainly, some of those operations would not be impacted based on the exceptions provided to a two-person crew mandate in the proposed rule. FRA's analysis for this proposed rule estimates that 16.35 percent of these one-person shortline operations would not meet the proposed exceptions.

Considering that the shortline community's current operations are the most likely to be impacted by this proposed rule, FRA conducted its own internal survey after the RSAC failed to reach a consensus recommendation in an attempt to more closely determine the potential impact on current operations. FRA Crew Size Shortline Survey-Final.pdf. FRA's internal survey was conducted by requesting that the operating practices personnel in each of FRA's eight regional field offices estimate the operational picture regarding shortlines (Class II and III railroads) within their respective regions in order to give FRA a nation-wide view. FRA's internal survey approximated that there are a total of 752 shortlines in the U.S. 206 of the shortlines handle "key trains" (i.e., trains with one or more loaded toxic-by-inhalation (TIH) or poisonous-by-inhalation (PIH) cars, or 20 or more loaded rail or tank cars or loaded intermodal portable tanks of certain hazardous materials including crude oil), an estimated minimum of 31,490 key trains are handled by shortlines each year, 115 shortlines operate one or more trains at over 25 mph, 14 shortlines operate with one-person train crews, and an estimated minimum of 127,792 trains operate at over 25 mph on shortlines.

Comparing FRA's survey to ASLRRA's survey, it appears that a big discrepancy is that ASLRRA is aware of more than twice as many shortlines utilizing one-person train

operations than FRA, even though ASLRRA received responses from what FRA found to be is less than 30 percent of the population of existing shortlines. Although many of these shortline operations are slow moving and will likely be excepted from the proposed two-person crew requirements in this proposed rule, the full extent of each of these shortline operations is unknown. It is because so much is unknown about the extent of one-person train crew shortline operations, including where they exist, that FRA believes the proposed approval process is necessary in order that the shortlines reveal themselves for some level of Federal safety oversight. Information revealing where and the extent of these one-person train crew operations would also permit FRA to potentially improve data collection and analysis of one-person operations. Otherwise, a shortline railroad's good safety record may be illusory and FRA would not have any reason to exercise oversight until after an attention-getting accident.

**B. The Proposal is Complimentary to Other Regulatory Initiatives, Not Duplicative**

This proposed rule is complimentary to, rather than duplicative of, other recent regulatory initiatives FRA has issued or is in the process of developing. These initiatives include: the implementation of PTC systems, the development of risk reduction and system safety programs, the development and implementation of comprehensive training programs for safety critical employees, and the development of fatigue management plans. Each of these initiatives will enhance safety in some manner, and may either aid a railroad in transitioning to an operation with fewer than two crewmembers or assist a railroad in identifying risks and mitigating those risks once such an operation is



established. However, none of these initiatives, either individually or collectively, are designed to ensure that a railroad engages in a proactive assessment of a change to an operation such as reducing the size of a train crew from two crewmembers to just one crewmember. The purpose of this regulatory action is to ensure that each railroad properly consider and evaluate the risks that will be introduced to an operation by reducing the existing crew size and that the railroad takes appropriate steps to mitigate those risks prior to implementing the operation. Thus, this proposal is proactive and is aimed at reducing or eliminating risk before it is introduced into actual operations, whereas many of the other regulatory initiatives being put in place are aimed at identifying and mitigating risks that already exist. This approach will ensure that the nation's safety regulator is part of this decision-making process and will ensure that safety and economic costs are not transferred to the communities and public where these operations might take place.

A subset of this issue was raised during the RSAC process that did not lead to a consensus recommendation. Some RSAC members requested that FRA address the application of a railroad safety risk reduction rule to train crew staffing issues during the Working Group deliberations. Section 103(a)(1) of the Rail Safety Improvement Act of 2008 (RSIA) directed FRA to require certain railroads to develop, submit to FRA for review and approval, and implement a railroad safety risk reduction program. See 49 U.S.C. 20156. Railroads required to comply with such a rule would include: (1) Class I railroads, (2) railroads with inadequate safety performance, and (3) railroad carriers that provide intercity rail passenger or commuter railroad passenger transportation (passenger

railroads). Risk reduction is a comprehensive, system-oriented approach to safety that determines an operation's level of risk by identifying and analyzing applicable hazards and developing strategies to mitigate that risk.

On December 8, 2010, FRA published an Advance Notice of Proposed Rulemaking (ANPRM) that solicited public comment on a potential rulemaking that would require each Class I railroad, each railroad with an inadequate safety record, and each passenger railroad to develop and implement a railroad safety risk reduction program. 75 FR 76346. On September 7, 2012, FRA then proposed requirements for a System Safety Program (SSP) rule that would partially satisfy the RSIA mandate by requiring each passenger railroad to develop and implement an SSP. 77 FR 55372. FRA developed the SSP NPRM with the assistance of the RSAC. As proposed, an SSP would be implemented by a written SSP plan that had been submitted to FRA for review and approval. If the NPRM becomes effective, a passenger railroad's compliance with its SSP would be audited by FRA, and the passenger railroad would also be required to conduct internal assessments of its SSP. FRA is currently developing, also with the assistance of the RSAC, a separate risk reduction rule, referred to as the risk reduction program (RRP), that would implement the RSIA mandate for Class I freight railroads and railroads with inadequate safety performance. Also under development with the RSAC is a related Fatigue Management Plan (FMP) rulemaking that would meet the RSIA mandate as it relates to fatigue management plans.

Railroads do not have unlimited resources available to mitigate all hazards and risks identified by an SSP. The SSP NPRM therefore explains that railroads will be

permitted to prioritize mitigating the most severe hazards associated with the greatest amount of risk. If a railroad's SSP does identify crew size as a hazard, mitigating crew size hazards and risks may depend on how the railroad prioritizes them in relation to other identified hazards and risks. Overall, an SSP is not required to mitigate specific hazards and risks, but must promote continuous safety improvement over time. As such, a railroad's decision regarding whether or not to mitigate crew size hazards and risks might also depend on how effectively that mitigation would promote continuous safety improvement, compared to mitigation of other identified hazards and risks. As proposed in the SSP NPRM, a railroad would be required to periodically review its program to determine whether the SSP goals are being met. As part of this review, a railroad might identify new hazards and risks or re-prioritize hazards and risks that have already been identified. In any case, although a reduction in crew staffing would certainly not be expected as a mitigation measure, a change in crew staffing from two crewmembers to only one crewmember would be a significant change. FRA would expect such a change to generate a full review of the Risk Reduction Program and an update to the related hazard analysis.

Although FRA anticipates that it will succeed in implementing SSP, RRP, and FMP requirements in the foreseeable future, there is no guarantee that any particular railroad will use an SSP, RRP, or FMP to address the crew staffing issue once the FRA's requirements are effective. Railroads may try and address issues that FRA believes could be solved by adding a second crewmember, but instead attempt to address the problems by finding other tangentially related solutions. For example, some railroads may choose

to spend resources on technology that the railroad believes offers adequate redundancy rather than keeping a second crewmember. The technology may improve safety but, as FRA-sponsored research summarized earlier in this preamble explains, may create new tasks, methods of operation, and other complications that are not fully accounted for. In other instances, a railroad may tackle fatigue issues with one-person crews by reducing the number of hours that a single person operation can work on any given day or providing for longer rest periods between tours of duty, but without regard to the fact that the lone crewmember is mentally fatigued and could benefit from another person's assistance. Another concern is that SSP, RRP, or FMP will not require railroads to address each and every risk. A railroad could identify two-person train crew staffing as an effective mitigation for certain risks, but nevertheless choose not to immediately address two-person crews because the railroad decides to prioritize other hazards and risks. Thus, as it will be up to each railroad to identify hazards, prioritize risks, and develop mitigation strategies as part of an SSP, RRP, or FMP, problems caused by inadequate staffing or engagement of a second crewmember may linger after an SSP, RRP, or FMP final rule is implemented. Additionally, as discussed previously, the SSP, RRP, and FMP rules will not apply to all railroads, which means that railroads other than Class I railroads, passenger railroads, and railroads with inadequate safety performance will not have to perform risk analyses pursuant to these rules that might identify crew size as a hazard presenting certain risks.

In conclusion, the future hazards posed by inadequate train crew staffing are common across the general railroad system of transportation and should not be left to be

mitigated piecemeal, dependent on a railroad choosing to implement such a mitigation measure. FRA has prioritized the risks posed by some one-person train operations over other potential hazards that a railroad may choose to address through a risk reduction-type program. This proposed rule is necessary for FRA to protect railroad employees and the general public by considering the safety risks of each type of one-person train crew operation and prohibiting operations that pose an unacceptable level of risk as compared to operations utilizing a two-person crew. Only specific crew staffing requirements would resolve this dilemma.

Furthermore, this proposal would not impede the implementation of these other regulatory initiatives. As noted above, the objectives of this regulatory proposal are quite different than other recent regulatory initiatives being advanced by FRA. This proposal is aimed at identifying and mitigating risks before they occur and to ensure that FRA has an active role in ensuring that a railroad has taken appropriate action before modifying an existing operation that has the potential of introducing risk into that operation. This proposed rule will in no way impede or prevent a railroad from implementing the other regulatory initiatives being advanced by FRA and will actually encourage the implementation and application of those initiatives in order to ensure and monitor the continued safety of train operations where less than two person crews are utilized. The other initiatives will ensure that base-level technology is in place when it is installed, that appropriate training is provided to any locomotive engineer operating as a one-person train crew, and that the risks associated with such one-person train crew operations are monitored and evaluated on an on-going basis. Thus, FRA views all of its recent

significant regulatory safety initiatives as being complimentary and necessary to this current proposal.

### **C. Identifying How the NPRM Differs from FRA’s RSAC Suggested Recommendations**

Some of the proposed rule text differs from the last version FRA proposed as recommendations to the Working Group that failed to reach consensus on any recommendations. Some of these differences will be familiar to the Working Group members because the differences reflect rule text versions FRA proposed during earlier Working Group meetings. Other proposed rule text changes reflect FRA concerns identified since the Working Group meetings were concluded.

In proposed section 218.121, the purpose and scope section, FRA added to the third sentence in paragraph (b) the words “and promotes safe and effective teamwork.” Upon drafting the NPRM, FRA realized that the issue of the roles and responsibilities of the second crewmember, as well as the ability of the second crewmember to communicate with the locomotive engineer, was a key factor in how this proposed rule would make train operations safe. The issue deserves mention in the purpose and scope and will hopefully aid each railroad in considering whether its train crewmembers are adequately trained in working as an effective team.

In proposed section 218.123, FRA made a few minor changes to the definitions from its RSAC suggestions. The definitions of “Associate Administrator” and “FTA” were not changed, but moved to the definitions section that applies to all of part 218. A definition of “trailing tons” was added because that term was used to help define the

work train exception in 218.127(d). Also, FRA changed the term “switching operation” to “switching service” for consistency so that the same term is used in this proposed rule as is used in three other Federal rail safety regulations. 49 CFR 229.5, 232.5, and 238.5.

In proposed section 218.125(c), FRA made slight modifications to the language describing the types of hazardous materials a train may transport that would require the train to be staffed with at least two crewmembers without an exception being applicable. The changes to this paragraph closely follow FRA’s proposed rule regarding the securement of unattended equipment. 79 FR 53356, 53383, Sep. 9, 2014, proposed 49 CFR 232.103(n)(6). The changes are intended to clarify the types and quantities of materials requiring at least a two-person train crew, unless the railroad receives special approval to operate such trains under proposed section 218.135.

In proposed section 218.125(d)(2), FRA added the word “directly” so that it is clear that a second crewmember not in the operating cab of the controlling locomotive when the train is moving must be able to communicate with the crewmember in the cab without having to go through an intermediary. A corresponding change has been made to proposed section 218.131(a)(2)(ii) for the same reason.

In proposed section 218.127(e), FRA had at one time suggested to the Working Group that remote control operations with a one-person train crew should be specifically limited operationally by restrictions that the railroad industry had previously agreed with FRA to abide by as guidelines. Those guidelines were specified in an earlier draft of FRA’s suggested recommendations to the Working Group, but then later removed in a late push to try and negotiate a consensus recommendation. Now that RSAC has failed to

reach a consensus, FRA has added these remote control operational restrictions back in because the agency is concerned with railroads trying to use remotely controlled locomotives beyond the equipment's designed limitations. FRA would appreciate comments regarding whether this language limiting remote control operations is necessary.

In proposed section 218.133, FRA has deviated from its RSAC suggested draft by putting forth two co-proposal options with some different requirements. The co-proposals do more than just extend the date by 1 year for continuing operations, from 2014 to 2015. For example, Option 1 co-proposes requiring FRA's explicit approval to continue any operations staffed without a two-person train crew and existing prior to January 1, 2015. In order to encourage railroads to reach a consensus Working Group recommendation, FRA had suggested that it would only issue notification if it disapproved of a railroad's one-person operation or thought that the operation could continue but with some additional restrictions. The change under proposed Option 1 puts a greater burden on FRA to do a thorough review of each one-person operation that railroads will want to continue and to normally provide notification within 90 days of receipt of the submission. However, it also provides clarity to each railroad wishing to continue an operation and not having to wonder whether FRA will announce that the operation is unsafe, without provocation, in the future. Co-proposal Option 2 is closer to the RSAC-suggested draft in this regard.

In both co-proposal options for section 218.133, FRA added a new paragraph, (a)(9), compared to the RSAC suggested draft. The proposed paragraph in the co-



proposal options requires that a railroad that wishes to continue any operations staffed without a two-person train crew and existing prior to January 1, 2015, must include certain additional information. Proposed paragraph (a)(9) requires that the railroad provide “[i]nformation regarding other operations that travel on the same track as the one-person train operation or that travel on an adjacent track. Such information shall include, but is not limited to, the volume of traffic and the types of opposing moves (i.e., either passenger or freight trains hauling hazardous materials).” FRA believes this information is readily available to host railroads, and estimates the time burden per railroad for providing this information will be 960 hours. FRA requests comments on this estimate. The previously numbered paragraphs (a)(9) and (a)(10) were renumbered as (a)(10) and (a)(11).

In proposed section 218.135, FRA has deviated from its RSAC suggested draft by putting forth two co-proposal options with some different requirements. FRA deleted some information in the version FRA suggested to the Working Group that would have been contained in paragraph (b)(2). Some Working Group members insisted that FRA contain an explicit exception from the two-person requirement whenever a railroad had implemented a PTC system. Although FRA and other Working Group members disagreed with such an explicit exception, FRA attempted to provide as much guidance as it believed was possible in FRA’s suggested recommendation if it helped achieve a consensus RSAC recommendation. The language FRA suggested to the Working Group included a statement that “FRA would likely grant a petition for special approval of a freight train operation with a one-person crew that has a positive train control system”

with certain capabilities. FRA believes, as a starting point for potential FRA-approval, the PTC system must meet all the requirements of part 236 of this chapter, have rear-end train monitoring and enforcement capabilities, and have some other combination of technologies and other operating safeguards. Other safeguards that would likely be considered include: electronically controlled pneumatic brakes; appropriate installation of wayside detectors, especially hot box, overheated wheel, dragging equipment, and wheel impact load detectors; enhanced scheduled track inspections with track inspection vehicles capable of detecting track geometry and rail flaws; implementation of a fatigue management system with set work schedules; or procedures for providing a one-person train operation with additional persons when necessary for en route switching, crossing protection, or any required train-related inspection. As the Working Group members who wanted the PTC exception provision found FRA's suggestion insufficient, and FRA finds the PTC exception provision unnecessary, there appears to be no reason to carry it forward in this proposed rule. The other changes from the RSAC suggested draft in the co-proposal options raise the question of whether a railroad should be required to wait for explicit FRA approval before initiating a new operation with less than two train crewmembers. The co-proposal options differ on the need for explicit FRA approval. Option 2 also contains an additional proposed requirement that the RSAC never discussed. That proposed requirement is that the railroad officer in charge of operations attest that a hazard analysis of the operation has been conducted and that the operation provides an appropriate level of safety.

#### **D. Electronic Submission and Approval Process**

If this proposed rule becomes final, non-exempt railroads that want to operate with less than a minimum of two crewmembers will need to submit information to FRA. The proposed rule provides an address for mailing such submissions to the Associate Administrator, and an electronic submission option. FRA plans to consider adding an electronic submission requirement in the final rule and would like to invite comments on this subject.

FRA has recently created electronic submission requirements to facilitate review of filings in other rulemakings. For example, under 49 CFR 272.105, FRA is requiring each railroad to file critical incident stress plans electronically through a website that FRA created. For the Training, Qualification, and Oversight for Safety-Related Railroad Employees final rule, FRA created a mandatory electronic submission process to allow the agency to more efficiently track and review programs with the caveat that an employer with less than 400,000 total employee work hours annually could opt to mail written materials rather than an electronic submission. See 49 CFR 243.113. 79 FR 66460, 66506, Nov. 7, 2014.

Another electronic submission option would be for FRA to utilize the already existing docketing system available at [www.regulations.gov](http://www.regulations.gov). For example, FRA could create one docket for all requests to continue existing operations under proposed § 218.133 and a second docket for all special approval petitions and comments under proposed § 218.135. Again, as the regulated community and the public have experienced using this docketing system, FRA appreciates any feedback on the use of the existing electronic docketing system and whether it could work well for these purposes.

Certainly, FRA is not restricted from sending written approval electronically. FRA may choose to reply to submissions that include an email address with an electronically served notice. In all instances of electronic submission or notices of approval/disapproval, the party serving notice has the burden of ensuring that proper service is completed.

## **VI. Section-by-Section Analysis**

### Section 218.5 Definitions

The NPRM proposes to add two definitions that will be applicable to all of part 218, not just the proposed subpart G. The two terms are only used in the proposed subpart G, and thus they do not pose any potential conflict in the other current subparts. FRA has decided to include these proposed definitions in this section because these terms are unlikely to ever have any other definition that would potentially conflict with another, future, proposed subpart to this part.

The proposed rule needs to define the term “Associate Administrator” so that it will be understood which FRA official would need to be served with a copy of certain documents required to be filed under other sections of the NPRM. A proposed definition of “FTA” should come as no surprise to those railroads that come under the Federal Transit Administration’s jurisdiction and would be expecting FRA to recognize FTA’s authority to regulate certain types of operations.

### Section 218.121 Purpose and scope

This section states that the purpose of this proposed subpart is to ensure that each train is adequately staffed and has appropriate safeguards in place when using fewer than

two-person crews for safe train operations. In order to ensure adequate staffing, the NPRM prescribes minimum requirements for the size of different train crew staffs depending on the type of operation. Currently, railroads are determining that many train operations can be safely staffed with less crewmembers than the industry standard of two: a locomotive engineer and a conductor. Although FRA employs approximately 400 inspectors who regularly monitor compliance with every class of railroad in the Nation, only about 1 out of every 5 of FRA's inspectors monitor operational compliance while the rest focus on equipment, track, signal, and grade crossing warning device maintenance and the transportation of hazardous materials. There is currently no specific prohibition that would prevent a railroad from choosing to operate a train with only one crewmember and, while FRA has emergency order authority to shut down unsafe operations, FRA would likely have difficulty implementing its emergency order statutory authority in situations where the railroad alleges it has been operating safely for years – unbeknownst to FRA, unless it had evidence that the railroad's operation created an unsafe condition or practice causing “an emergency situation involving a hazard of death, personal injury, or significant harm to the environment.” 49 U.S.C. 20104. Although it has done so indirectly, FRA has rejected some one-person passenger operations based on the passenger train emergency preparedness approval process required under 49 CFR 239.201. This proposed rule would provide passenger railroads that are considering one-person operations with additional insight into the safety considerations FRA deems essential before the agency would approve such an operation.

Although railroading continues to trend as safer each year, FRA is concerned that

some railroads are removing a second crewmember without reflecting on the safety risks posed to railroad employees and the general public by having one less crewmember staffing each train. The second crewmember may prevent a lone crewmember from suffering from task overload by monitoring and warning of temporary restrictions, acknowledging signal indications, communicating on the radio, protecting the public at highway-rail grade crossings, and updating the train consist list or other required paperwork. Operations could also pose a higher risk to employees and the general public due to the types of commodities hauled, the speed or tonnage of the train, or other complexities of the operation. The decision to propose a requirement for a minimum number of crewmembers on certain types of operations is intended to ensure that each railroad implementing one-person operations has adequately identified potential safety risks and taken mitigation measures to reduce the chances of accidents, as well as the impact of any accident that may still occur.

This subpart also prescribes minimum requirements for the roles and responsibilities of train crewmembers on a moving train, and promotes safe and effective teamwork. The public perception may be that there are always at least two crewmembers, and that the crewmembers are always in the locomotive when the train is moving. The proposed rule recognizes the realities of safe railroading practices while prohibiting railroads from allowing the second crewmember to disengage, mentally or physically, from the train movement. As the FRA-sponsored research in the preamble found, just because multiple crewmembers are present on the train does not mean that they have formed an expert team. The proposed requirements in this subpart would

ensure that a second crewmember who is located anywhere outside the cab of the controlling locomotive while the train is moving must have the ability to directly communicate with the crewmember operating the train. Having direct communication lines means that the crewmembers do not have to work through an intermediary, such as the dispatcher, to communicate with one another. Typically, direct communication will mean that the crewmembers are communicating by radio or hand signals.

Finally, proposed paragraph (b) of this section would expressly allow each railroad to prescribe additional or more stringent requirements in its operating rules, timetables, timetable special instructions, and other instructions. Thus, the NPRM does not prohibit a railroad from requiring more than two crewmembers or from having additional or more stringent requirements governing the proper roles and responsibilities of a second, or additional, crewmembers as long as the train operation is in compliance with this proposed subpart.

#### Section 218.123 Definitions

The proposed rule offers a definition for the phrase “tourist, scenic, historic, or excursion operations that are not part of the general railroad system of transportation” in order to explain the plain meaning of that phrase. The phrase means a tourist, scenic, historic, or excursion operation conducted only on track used exclusively for that purpose (i.e., there is no freight, intercity passenger, or commuter passenger railroad operation on the track). If there was any freight, intercity passenger, or commuter passenger railroad operation on the track, the track would be considered part of the general system. See 49 CFR part 209, app. A. In the section-by-section analysis for proposed § 218.127, there is

an explanation for why FRA is proposing not to exercise its jurisdiction over these types of railroad operations.

The proposed rule defines “trailing tons” to mean the sum of the gross weights – expressed in tons – of the cars and the locomotives in a train that are not providing propelling power to the train. This term has the same meaning as in 49 CFR 232.407(a)(5), which is a regulation concerning end-of-train devices. The NPRM needs this term in order to help define what a work train is in § 218.127(d).

The NPRM proposes a definition of “train” that is consistent with the way FRA has defined the term in other Federal rail regulations. See, e.g., 49 CFR 229.5, 232.5 and 238.5. For purposes of this proposed rule, a train means one or more locomotives coupled with or without cars, except during switching service. The term “switching service” is also defined in the section. The definition of train is not intended to contain all of the exceptions to the crew size and second crewmember role and responsibility requirements; instead, those exceptions are found in other sections, clearly identified as exceptions, in the proposed rule text.

In order to clarify that a “train” does not include switching operations, FRA proposes a definition for “switching service” that is consistent with the way FRA has defined the term in other Federal rail regulations. See, e.g., 49 CFR §§ 229.5, 232.5 and 238.5. Switching service means the classification of rail cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not



constitute a train movement. FRA has not limited switching service to yard limits, although switching service often takes place within a rail yard.

#### Section 218.125 General crew staffing and roles and responsibilities of the second crewmember for freight and passenger trains

This proposed section includes the general crew staffing requirements, as well as the roles and responsibilities of the second crewmember for both freight and passenger trains. The exceptions to the general requirements are found in other sections of the proposed rule.

Proposed paragraph (a) requires each railroad to comply with the requirements of this subpart, and provides the railroad with the option to adopt its own rules or practices to do so. A railroad may want to adopt its own rules or practices that it instructs its employees to comply with rather than asking employees to directly comply with a Federal regulation. As proposed in the purpose and scope section, each railroad is free to prescribe additional or more stringent requirements as it sees fit. Regardless of whether a railroad or any person fails to comply with this subpart, or the railroad's rules or practices used to ensure compliance with the requirements of this subpart, that railroad or person shall be considered to have violated the requirements of this subpart and may be subject to an FRA enforcement action. Although this would be true even without this paragraph, FRA has proposed this paragraph because it gives the regulated community an explicit warning that FRA can take enforcement action under appropriate circumstances.

Paragraph (b) proposes the essential requirement of the entire subpart. That is, each train shall be assigned a minimum of two crewmembers unless an exception is

otherwise provided for in this subpart. As explained in the preamble, a second crewmember can help prevent a single crewmember from experiencing task overload and losing situational awareness. A lone crewmember that loses situational awareness would not be able to benefit from a second crewmember who provides adequate warnings of operational restrictions and can complete some of the tasks that may be causing the lone crewmember to be overloaded. Even if an exception applies, a railroad may choose to assign a minimum of two crewmembers to each of its trains and would certainly be in compliance with this proposed subpart if it did so.

Paragraph (c) contains the proposed requirement that two crewmembers are always necessary when the train contains certain quantities and types of hazardous materials. It is proposed that this requirement be applicable regardless of whether an exception somewhere else in the subpart appears to apply. In paragraph (c)(1), FRA proposes to mandate a minimum of two crewmembers assigned to a train that contains even just one loaded freight car of poisonous by inhalation material (PIH), as defined in 49 CFR 171.8, including anhydrous ammonia (UN 1005) and ammonia solutions (UN 3318). Loaded PIH tank cars pose a tremendous safety risk to the general public and a second crewmember's actions can certainly provide an additional safeguard to compliance with all railroad rules and operating practices. In paragraph (c)(2), FRA similarly addresses the safety issues that are applicable to "key trains," which commonly refers to 20 or more loaded freight cars, freight cars loaded with bulk packages, or intermodal portable tank loads containing certain types of hazardous materials, such as crude oil. The 20-car threshold follows FRA's Emergency Order 28 and proposed

securement regulation and is based on AAR's definition of a "key train" in OT-55N. FRA is proposing a threshold of 20 cars instead of 5, 10, or 15 cars because FRA is willing to allow one-person operations when they pose less risk to the public, and by virtue of fewer hazmat cars, the risk should be less. Local trains, moving less than 20 cars, will likely be operated at slower speeds and pose less risk. The greatest risk is with these key trains. Although a single car of crude oil can be dangerous, a single car does not pose nearly as great a risk as a single loaded PIH tank car – which explains why the proposed rule requires that at least 20 of these types of cars must be in the train before the "no exception" to the minimum of two crewmembers requirement is triggered. Thus, based on an RSAC consensus recommending special securement procedures of unattended trains containing the types and quantities of materials described in this proposed paragraph, FRA believes special care should also be provided by a minimum of two crewmembers during rail transport. FRA would appreciate comments regarding whether this proposed requirement is too stringent or not stringent enough.

Proposed paragraph (d) contains the general requirements pertaining to the roles and responsibilities of a second crewmember when the train is moving. The NPRM is written under the premise that the locomotive engineer is the first crewmember and is always located in the cab of the controlling locomotive when the train is moving, unless the controlling locomotive is being operated remotely. FRA uses the term "second crewmember" largely to mean a conductor, under 49 CFR part 242, but with the understanding that since a single crewmember could hold multiple operating crew certificates, it is possible that a second crewmember could be designated as having a job

title other than conductor and not require a locomotive engineer or conductor certificate. See 49 CFR 242.213.

The proposed requirement in paragraph (d) is written with an expectation that, in many operations, the best location for the conductor is in the cab of the controlling locomotive when the train is moving. When a conductor is in the cab, the crewmembers can easily communicate about upcoming restrictions, signal indications, and methods of operation. These job briefings and other timely communications help ensure that the locomotive engineer is operating safely and in compliance with all applicable rules and procedures. Knowing that the conductor can provide reminders of restrictions or a level of assurance that the engineer has called the signal correctly may reduce the stress level of the engineer. As FRA explained in the preamble, it is when employees are under stress and overloaded with tasks, that a one-person operation is more likely to lose situational awareness and make a mistake, i.e., a human factor failure.

Although FRA believes the optimal location for a second crewmember safety-wise is usually in the operating cab of the controlling locomotive when the train is moving, FRA certainly recognizes that safe operations can be conducted when the second crewmember is located somewhere else on the train. For example, FRA is aware that some operations are designed so that the second crewmember is on a caboose at the back of the train, which can facilitate train movements that require manually operating switches at the rear of the train. Other operations may be designed or require that a second crewmember ride in a locomotive that is not the controlling locomotive. FRA does not intend to propose a rule that would prohibit a second crewmember from safely

performing his or her duties from somewhere else on or near the moving train.

In proposed paragraphs (d)(1) through (d)(4), the general requirement in proposed paragraph (d) is refined to allow for the second crewmember to be located anywhere outside of the operating cab of the controlling locomotive when the train is moving under certain conditions.

In paragraph (d)(1), it is proposed that the normal location of the second crewmember be on the train “except when the train crewmember cannot perform the duties assigned without temporarily disembarking from the train.” That is, the proposed general requirement for a second crewmember, not considering all the exceptions in the other sections, is for that crewmember to be on the train when it is moving except when it is necessary for that crewmember to temporarily disembark. The proposed general requirement is intended to exclude a situation where the conductor is either never on the train, or spends significant periods of time disassociated from physically being on or near the train. Thus, if a second assigned crewmember is ordered to stay in a yard tower, or other fixed location not on the train, for the majority of the time that the train is moving, the second crewmember would not be in compliance with this proposed general requirement that only permits “temporarily disembarking from the train.” The relaxation of the requirement that the second crewmember be on the train is intended to permit only temporary situations, i.e., movements of short time or duration that are necessary in the normal course of train operations. For example, a conductor may get off a train to throw a switch and then the train is moved with the conductor on the ground so that the conductor can get back in the controlling locomotive cab without having to walk the

entire length of the train. In other instances, a conductor might have to throw a switch but the train cannot easily be moved to pick up the conductor so a workaround practice or procedure has been developed to drive the conductor in a motor vehicle, or on a following train, several miles away where the conductor can then safely reboard the assigned train. FRA considers these both examples of temporarily disembarking from the train even though the latter example results in the train moving for several miles without the second crewmember on the train. To the contrary, if a railroad's practice is to stop the train many miles away from the switch, after passing multiple places where the train could be stopped safely for the conductor to board, FRA would view the practice as more than a temporary situation and it would appear to violate the proposed general requirement.

Previously in the background section (see IV. No Recommendation From the RSAC Working Group), FRA advised that a document prepared by AAR has been submitted to the docket which describes six situations where a second train crewmember would need to be located outside of the operating cab of the controlling locomotive when the train is moving in order to continue to perform the duties assigned, and then lists seven additional examples. AAR Discussion Document TCWG-14-03-31-04.pdf. The second train crewmember would then need another way to catch up to the train to get back on it. As stated previously, FRA believes all of the operations described in that AAR document are acceptable under this proposed rule, as long as the second train crewmember that is separated from the train can directly communicate with the crewmember in the cab of the controlling locomotive pursuant to proposed § 218.125(d).

Meanwhile, FRA anticipates that there may be circumstances where direct communication is temporarily lost due to radio malfunctions or other communication failures. Sometimes the loss of communication will be due to circumstances within the control of the crewmembers or will be due to known radio signal obstacles (e.g., geographical obstacles such as mountains). FRA accepts that direct communication may be lost temporarily due to a variety of factors, and will be looking to see that a railroad has implemented procedures or practices to reduce any potential loss of direct communication by crewmembers to a minimum before considering a potential enforcement action. FRA would appreciate comments on this issue.

Proposed paragraph (d)(2) contains the requirement that, when the second crewmember is anywhere outside of the operating cab of the controlling locomotive when the train is moving, the second crewmember has the ability to directly communicate with the crewmember in the cab of the controlling locomotive. FRA is not proposing to prescribe the methods of communication in this regulation. Deciding appropriate methods of direct communication between crewmembers is left to each railroad. Typically, crewmembers that are visible to one another will communicate by hand signals as the employees' voices cannot be heard over the locomotive engine from any distance outside the cab. Most other times, crewmembers will communicate with one another by radio or other wireless electronic devices in accordance with railroad rules and procedures and FRA's railroad communications regulation found at 49 CFR part 220. The important aspect of this proposed general requirement is that the assigned crewmembers are in direct contact with one another and do not have to communicate

through an intermediary; otherwise, it would be hard to justify any perceived safety benefit to having a detached second crewmember that lacks the ability to communicate with the crewmember in the cab of the controlling locomotive while the train is moving. The proposed requirement focuses on the second train crewmember's ability to communicate with the locomotive engineer, but the expectation is that the engineer would also have the ability to directly communicate with the second crewmember and request assistance, and that the second crewmember would be able to quickly respond.

Passenger and commuter locomotives do not always have room for a second crewmember in the locomotive control compartment, but a second crewmember may be necessary to provide assistance for shoving or pushing movements, or to otherwise assist the routine operation of the train. If the second crewmember is a conductor, that conductor may not always have a view of upcoming signal indications. For that reason, even though the passenger or commuter railroad conductor has some operating duties, the conductor may feel some disassociation with the operation of the train. FRA believes railroads should look closely at the operating duties that a second person not located in the cab can perform, as long as the second crewmember has the ability to directly communicate with the locomotive engineer. For example, before leaving each station stop, the conductor could remind the locomotive engineer of any upcoming restrictions that will be reached before arriving at the next station stop. Such job briefings between crewmembers have long been considered an effective practice by expert teams.

Proposed paragraphs (d)(3) and (d)(4) contain the last general requirements that apply when the second crewmember is anywhere outside of the operating cab of the



controlling locomotive when the train is moving. The proposed paragraphs require that the second crewmember must be able to continue to perform the duties assigned even though the crewmember is outside of the operating cab of the controlling locomotive when the train is moving and, under these circumstances, the location of the second crewmember must not violate any Federal railroad safety law, regulation, or order. These proposed general requirements are catch-all provisions intended to ensure that each railroad and second crewmember does not conclude that the provisions in this regulation can somehow be used to avoid complying with a person's assigned duties or any Federal requirement. FRA understands that passenger train conductors will normally be in the body of the train, not in the locomotive cab with the engineer. In passenger train operations, normal areas for a conductor to occupy on a train include the locomotive, the passenger cars, the caboose, the side of a freight car when protecting a move, and on the ground either throwing switches or inspecting the train.

Finally, with regard to proposed paragraph (d), FRA's main concern is with adequately staffed moving trains, not stopped trains. The proposed regulatory text is silent regarding any requirements for the location of a second crewmember on a stopped train as FRA suggests that this is an issue that should be left for each railroad to decide. Of course, any person may address this issue in a comment if it is believed that FRA has missed a safety issue and should regulate the roles and responsibilities of crewmembers on a stopped train. FRA believes that the proposed definition of "roles and responsibilities" reflects the operational status quo and will not result in any costs or benefits. FRA requests public comment on this assumption.

## Section 218.127 General exceptions to two-person crew requirement

This proposed section is the first of several sections explaining operational exceptions to the general requirements for assigning a minimum of two crewmembers on each train specified in proposed § 218.125(b) and the location requirements for the second crewmember found in proposed § 218.125(d). In the analysis for each paragraph, FRA explains why each of these operations are not considered complex, traveling short distances, at low speeds, or under special operating rules, and therefore that they pose a low risk of causing a catastrophic accident with a one-person crew. As a reminder, the introductory paragraph of this section reiterates that the exceptions in this section do not apply when a train is transporting the hazardous materials of the types and quantities described in § 218.125(c). This proposed section is intended to cover those general exceptions that apply to both passenger and freight trains.

In this proposed section, five general exceptions are identified. The exceptions are written in such a way that all of the operations can easily be described in three words or less. As FRA has been able to describe the operation in such shorthand, the regulatory text uses those descriptions at the beginning of each paragraph to help convey to the reader where the exception can be found.

In paragraph (a), the proposed rule would except trains performing helper service from the two-person crew minimum requirement. Rather than define what helper service means in the definitions section, the regulatory text contains sufficient information to explain what the term means. The proposed paragraph states that a train is performing helper service when it is using a locomotive or group of locomotives to assist another

train that has incurred mechanical failure or lacks the power to traverse difficult terrain. Helper service is a common service performed in the railroad industry as a one-person operation. It is typically not considered a complex operation as the locomotive engineer would be required to operate to the train needing assistance, and then couple to the train in order to provide assistance pushing or pulling it. The proposed paragraph clarifies that helper service is not limited to the time that the helper locomotive or locomotives are attached to the train needing assistance. That is, helper service also includes the time spent traveling to or from a location where assistance is provided. As with all these exceptions, a railroad may decide that a certain helper service operation is more complex and that more than one crewmember should be assigned to the helper service train; however, considering that cars are not attached and a railroad has an incentive to not dispatch a helper service train from a great distance away from the train needing assistance, FRA does not believe this type of operation poses a great risk to railroad employees or the general public.

Proposed paragraph (b) excludes a train that is a tourist, scenic, historic, or excursion operation that is not part of the general railroad system of transportation from the two-person crew requirement. In § 218.123, FRA defined these operations as “a tourist, scenic, historic, or excursion operation conducted only on track used exclusively for that purpose (i.e., there is no freight, intercity passenger, or commuter passenger railroad operation on the track).” Excluding these types of operations from this proposed rule is consistent with FRA’s jurisdictional policy that already excludes these operations from all but a limited number of Federal safety laws, regulations, and orders. Because

these operations are off the general system, the general public does not have to worry that the train could collide with a train carrying hazardous materials or a commuter passenger train. Proposed paragraph (b) would exclude tourist operations from the two-person crew requirement regardless of whether the operations are “insular” or “non-insular.” If the tourist operation is “non-insular,” it is possible that the train could collide with a motorist at a highway-rail grade crossing. However, these “non-insular” operations would generally involve relatively short tourist-type trains operating at slow speeds thereby reducing the probability of an accident with a motorist or even a serious derailment. Additionally, tourist operations usually have plenty of paid or volunteer train crewmembers that can assist any passengers in case of an emergency.

Similar to the safety rationale for the proposed helper service exception, proposed paragraph (c) would exempt lite locomotives or a lite locomotive consist from the two-person crew requirement. That is, when a locomotive or a consist of locomotives is not attached to any piece of equipment, or attached only to a caboose, the railroad is conducting a type of limited operation that generally poses less of a safety-risk to railroad employees or the general public. Lite locomotives would mainly be operating as a train in order to move the locomotives to a location where the locomotives could be better utilized for revenue trains that are taking or delivering rail cars to customers, or to other railroad yards where the locomotives can be used in switching operations. Additionally, lite locomotives may be operating as a train in order to take more than one locomotive to a repair shop for servicing. The proposed paragraph includes a definition of “lite locomotive” rather than including the definition in the subpart’s definition’s section. The

definition proposed is consistent with the definition in FRA's Railroad Locomotive Safety Standards regulation found in 49 CFR 229.5. However, this NPRM includes a further clarification that lite locomotive "excludes a diesel or electric multiple unit (DMU or EMU) operation." The reason for this additional clarification is that a DMU or EMU is a locomotive that is also a car that can transport passengers, and if the proposed rule did not contain this clarification then it could be interpreted that a passenger train containing either a single or multiple DMUs or EMUs would not need a minimum of two crewmembers. FRA has further clarified DMU/EMU exceptions for passenger trains in proposed § 218.129.

Proposed paragraph (d) would exempt work train operations from the two-person crew requirement. "Work train" is defined in this paragraph as operations where a non-revenue service train of 4,000 trailing tons or less is used for the administration and upkeep service of the railroad. This portion of the proposed definition of work train is the same as the definition FRA provided for in 49 CFR 232.407(a)(4), in a regulation requiring end-of-train (EOT) devices. FRA considered whether it is necessary for the work train exception to have a trailing tons limitation. FRA considered that a work train with 4,000 trailing tons would allow a railroad to operate a work train with potentially up to 50 cars attached to locomotives. A work train that contains up to 50 cars provides a railroad with a lot of flexibility in permitting such trains to be operated without a minimum of two crewmembers. Again, some railroads may voluntarily choose to assign two crewmembers even where the proposed rule does not require it. Meanwhile, a work train with more than 4,000 trailing tons appears to be getting so long that additional

operational complexities are likely to arise where a second crewmember would be extremely beneficial for safety purposes. For example, if a train had to stop so a crewmember could throw a hand-operated switch, and the switch had to be returned after use, it is possible that the train could be blocking a highway-rail grade crossing for twice as long if a one-person operation required walking the length of the train round-trip versus a second crewmember being dropped off and only walking one way. Finally, the proposed exception for work trains engaged in maintenance and repair activities on the railroad includes when the work train is traveling to or from a work site. Work trains mainly haul materials and equipment used to build or maintain the right-of-way and signal systems. Work trains are unlikely to be hauling hazardous materials (unless extra fuel is needed to power machinery) and are generally not considered complex operations. They often travel at restricted speed, which is a slow speed in which the locomotive engineer must be prepared to stop before colliding with on-track equipment or running through misaligned switches. FRA would appreciate comments on the range of safety risks posed by work trains and the 4,000 trailing tons limitation to see if it is too expansive.

Proposed paragraph (e) would permit an exception to the two-person crewmember requirement whenever remote control operations are conducted under certain circumstances. Because the general requirement for a two-person crew minimum only applies to trains, and the definition of train excludes switching service, this exception applies to the use of a remotely controlled locomotive (RCL) that is traveling between yards or customers' facilities, with or without cars. Typically, RCL operations involved

in switching will have a crew consisting of either one or two crewmembers. However, in switching, an RCL operation with two crewmembers is not a traditional locomotive engineer and conductor train crew arrangement. Instead, each crewmember would have a remote control transmitter and would alternate taking turns controlling the RCL when the RCL was in close proximity to that crewmember. This “pitch and catch” arrangement is more like having two independent one-person crews who can do all the duties of both a locomotive engineer and a conductor.

Although FRA has long perceived RCL operations as being best utilized for switching services, it is understandable that a railroad might need to move an RCL from one location to another where the RCL can be more efficiently used. FRA has recently become aware that more railroads appear to find it an acceptable practice to use a one-person RCL job to service customers. FRA does not find the practice inherently unsafe given the limitations of the technology. However, FRA might be more concerned if railroads tried to operate the one-person RCL jobs at speeds greater than 15 mph, and with increased complexity beyond the known acceptable limitations previously acknowledged by the industry. The NPRM reflects these acceptable limitations and a copy of the correspondence reflecting those agreed upon limitations has been added to the docket.

The RCL operations limitations do not contain a distance restriction, although FRA’s guidance on the issue explained that the agency expected that an added limitation would be for these operations to be restricted to main track terminal operations. Considering the 15 mph speed restriction, FRA did not anticipate that RCL operations

would expand beyond main track terminal operations. Although FRA does not believe that RCL operations that are so limited need a distance restriction, FRA would appreciate any comments on this issue.

#### Section 218.129 Specific passenger train exceptions to two-person crew requirement

This proposed section permits specific passenger train exceptions to the general requirements for assigning a minimum of two crewmembers on each train. Three exceptions that apply only to passenger trains have been identified in this proposed section. Although no consensus was reached during the RSAC deliberations, FRA believes the passenger railroad community was satisfied that these exceptions would be adequate to prevent serious disruptions in passenger train service without taking on great safety risks.

In paragraph (a), the proposed rule would allow a passenger train operation with less than two crewmembers in which the passenger train's cars are empty of passengers and are being moved for purposes other than to pick up or drop off passengers. The exception clearly does not apply just because a passenger train happens to be empty of passengers. Passenger trains might need to be moved without passengers for repairs or for the convenience of the railroad.

Although empty passenger trains pose some of the same safety concerns as trains loaded with passengers (e.g., excessive speed, compliance with signal indications, and safety at highway-rail grade crossings), many commuter operations are designed for only one person in the cab of the controlling locomotive. In proposing this exception, FRA is showing a willingness to recognize the reduced safety concerns of these empty passenger



train operations and leave it to each railroad to determine whether there are other adequate safeguards in place to ensure that the one-person operation is safe. Certainly, FRA does not expect this proposed rule will encourage those railroads that operate with a minimum of a two-person crew on empty passenger trains to take undue risk by taking the second crewmember off this assignment. Instead, FRA is trying to avoid a situation where the proposed rule would require adding a second crewmember who is essentially not performing any safety functions. The exception is geared more to address the lack of a need for more than one crewmember on a train with no passengers. On passenger trains, one of the central safety concerns is how the crew will protect the passengers when getting on or off the train, or in case of an emergency. If the train does not have any passengers on board and will not be picking up any passengers, a second crewmember is not needed to address any passenger's safety concerns. On the other hand, if passenger trains may encounter freight trains on the same track or an adjacent track, if switches need to be thrown, or if the train will be engaging in shoving or pushing movements, it may be beneficial to add a second crewmember to address these operating conditions or any potential emergency situations.

In proposed paragraph (b), an exemption from the two-person crew minimum is permitted to recognize operations that FRA has previously determined could potentially be operated safely with a one-person crew. The exception to the two-person crew general requirement is for a passenger train operation involving a single self-propelled car or married-pair unit, e.g., a DMU or EMU operation, where the locomotive engineer has direct access to the passenger seating compartment and (for passenger railroads subject to

49 CFR part 239) the passenger railroad's emergency preparedness plan for this operation is approved under 49 CFR 239.201. As previously addressed in the analysis for the lite locomotive exception in § 218.127(c), a DMU or EMU is a locomotive that is also a car that can transport passengers. These self-propelled cars may be coupled together to form a train but are often designed so that a person cannot walk to another car without getting off the train. A married-pair unit is about the length of two cars, but allows a person to walk between the two cars/units without getting off the train. In only one instance has FRA approved the emergency preparedness plan for a one-person crew passenger train operation with the consideration that the sole crewmember could stop the train and assist the passengers without stepping off the train in an emergency. In deciding whether to approve an emergency preparedness plan, FRA will also consider the physical characteristics of the territory and how the operation would have the potential to put passengers in danger in case of a train breakdown, accident, or evacuation. For example, FRA will consider whether passengers could easily evacuate from the train with minimal assistance. Some passenger cars have door thresholds that are 48 to 51 inches above the top of the rail. With the door that high off the ground, a ladder would need to be deployed and some passengers would likely need assistance evacuating down the ladder to an area of safety. Even with good signage, passengers who are not trained to know what to do in an emergency might not realize the ladder is available, might not know how to deploy it, or might assume additional risk by rushing to evacuate without deploying it. This is exactly the type of situation where a trained second person could provide valuable assistance. Thus, if an emergency preparedness plan is required, FRA approval of that

plan utilizing a one-person operation is an essential element of being able to utilize this proposed exception.

In the proposed paragraph (b) exception, FRA has considered the concerns of tourist railroads that would not be subject to the § 239.201 emergency preparedness plan FRA approval requirement. Tourist railroads, including general system tourist roads, are not subject to 49 CFR part 239, as that passenger train emergency preparedness regulation is expressly inapplicable to “[t]ourist, scenic, historic, or excursion operations, whether on or off the general railroad system.” See 49 CFR 239.3(b)(3).

Therefore, general system and non-general tourist operations are not subject to § 239.201. In proposing this exception, FRA certainly did not mean to create a new requirement for a tourist railroad to comply with the passenger train emergency preparedness regulation in part 239. Thus, this exemption expressly requires FRA approval under § 239.201 only for passenger railroads subject to 49 CFR part 239.

In proposed paragraph (c), an exception from the two-person crew requirement is offered for a rapid transit operation in an urban area that is connected with the general railroad system of transportation under certain conditions. The exception itself clarifies that a rapid transit operation in an urban area means an urban rapid transit system or a light rail transit operator. For the exception from the two-person crew requirement to be used, a railroad operating a rapid transit operation in an urban area connected with the general system must ensure that all three listed conditions are met. First, the biggest safety concern with these rapid transit operations on the general system is that they have the potential to collide with much heavier freight or passenger trains. In such a collision,

the rapid transit train is likely to suffer significant equipment damage and the potential for catastrophic injuries to passengers would be great. By requiring that these operations be “temporally separated from any conventional railroad operations,” the NPRM clarifies that the rapid transit operations could not potentially collide with heavier, conventional train operations unless the operations were not properly temporally separated. A temporally separated light rail operation on the general system is required to obtain an FRA-approved waiver demonstrating an acceptable level of safety, so FRA would have assurances that the operation can be conducted safely. See 49 CFR part 211, app. A, V. *Waivers That May Be Appropriate For Time-Separated Light Rail Operations*. The second and third conditions that must be met relate to the fact that these rapid transit operations in an urban area on the general system may be subject to the U.S. Department of Transportation, Federal Transit Administration’s (FTA) jurisdiction. FRA does not want to assert jurisdiction over an operation where FTA is already asserting adequate jurisdiction to assure safety for railroad employees and the general public.

#### Section 218.131 Specific freight train exceptions to two-person crew requirement

This proposed section permits specific freight train exceptions to the general requirements for assigning a minimum of two crewmembers on each train. As a reminder, the introductory paragraph of this section reiterates that the exceptions in this section do not apply when a train is transporting the hazardous materials of the types and quantities described in § 218.125(c). Three exceptions that apply only to freight trains have been identified in this proposed section.

Proposed paragraph (a) identifies two specific freight train exceptions that are

only applicable for small railroads known as Class III railroads. These exceptions are FRA's attempt to provide additional relief to small businesses in the railroad industry, in addition to the relief granted by the exceptions in the other sections of this proposed rule. As a prerequisite to using either of the small railroad exceptions, the railroad must determine whether the train will be operated on a railroad and by an employee of a railroad with less than 400,000 total employee work hours annually. If that is the case, there are two types of operations identified where a train can be operated with less than the required two-person crew.

The first excepted small railroad operation would take place at speeds not exceeding 25 mph and at locations where there are no heavy grades. For this exception to be used, FRA has described heavy grade as being equal to or more than 1 percent over 3 continuous miles or 2 percent over 2 continuous miles. In FRA's experience, Class III railroads that operate trains over their own track, at relatively slow speeds, and over territory without steep hills or mountains, do not pose an unacceptable safety risk to the general public or railroad employees if conducted with only one crewmember. Most Class III railroads maintain their own track to no greater than Class 2 track standards, which allow freight trains to be operated at speeds no greater than 25 mph anyway. See 49 CFR 213.9. Again, this is a minimum standard and a Class III railroad could certainly require two or more train crewmembers if the operation's safety would be compromised by using only one person.

The second excepted small railroad operation would take place at speeds not exceeding 25 mph and where a second train crewmember is assigned, but is not

continuously on or observing the moving train as would be expected of a second crewmember. Instead, the second crewmember is assigned to intermittently assist the train's movements at critical times. For example, the second train crewmember may be "shadowing" the train by traveling alongside the train in a motor vehicle. The second crewmember could assist with flagging a highway-rail grade crossing, throwing hand-operated switches, or switching service when the train enters a yard or customer's facility. The second crewmember must also have the ability to directly communicate with the crewmember in the cab of the controlling locomotive. Such communication is essential to holding any required job briefings to exchange critical information about upcoming restrictions or difficult operational concerns. Most commonly, communication in this context will be by radio (or other wireless electronic devices in accordance with railroad rules and procedures and FRA's railroad communications regulation found at 49 CFR part 220), and direct communication means that the crewmembers have the ability to communicate with one another without going through an intermediary, such as a dispatcher. The proposed requirement focuses on the second train crewmember's ability to communicate with the locomotive engineer, but the expectation is that the engineer would also have the ability to directly communicate with the second crewmember and request assistance, and that the second crewmember would be able to quickly respond. In this exception, a small railroad operation is assigning a second crewmember but has the flexibility to have the second crewmember travel separately from the train. During the RSAC deliberations, shortline railroad representatives expressed a request for this type of flexibility. As these operation are to be conducted at relatively low speeds and under

conditions where the one-person crew on board the train is intermittently assisted, it appears that the second crewmember can play a critical role in improving the safety of the operation even if the person is not on board or observing the moving train at all times.

The third specific freight train exception to the two-person crew general requirement in this proposed section can be found in paragraph (b). The title of this proposed paragraph indicates that it is intended to apply to what are commonly referred to as mine load-out or plant dumping operations. Even if the railroad does not use one of those terms, any similar operation which involves a freight train being loaded or unloaded in an assembly line manner at an industry while the train moves at 10 mph or less would be excepted from the two-person crew requirement. The exception is generous in that it allows these operations to be conducted at up to 10 mph. FRA expects that most of these loading or unloading operations will take place at under 6 mph, but has expanded the maximum speed to 10 mph in order to give each railroad plenty of leeway without impacting the efficiency of the loading or unloading operation. Some of these operations are overseen by a person in a tower or on the ground that can provide oversight into whether the cars are being loaded or unloaded properly. That person would be expected to be able to communicate with the locomotive engineer operating the train. As these operations are most likely being conducted at a railroad yard or a customer's facility, and at low speeds, the railroad and its customer are assuming the risk of not having a second crewmember engaged or not operating at a safe speed. Considering the low speeds and low safety risk to railroad employees and the general public, FRA believes an exception to the two-person crew requirement is warranted.

Section 218.133 Continuance of freight operations staffed without a two-person train crew prior to January 1, 2015

This is the first of two proposed sections in which FRA is co-proposing two options. In this proposed section, each railroad may continue any one-person train operations that were conducted prior to January 1, 2015, as long as (1) the train is not transporting the hazardous materials of the types and quantities described in § 218.125(c) and, (2) after submitting a description of the operations, FRA does not find that the operation poses unacceptable safety risks and the railroad has implemented or agreed to implement off-setting actions required by FRA. FRA is not proposing to include in the regulatory text the “unacceptable safety risks” standard described here, or make approval decisions using a set of conditions or performance standard(s). FRA does not believe a one-size-fits-all approach will work. Each railroad will need to present its particular one-person operations and make the case that the safety concerns added by reducing crew staff have been addressed in some reasonable manner. FRA is not willing to say that PTC by itself is enough because even PTC has its limitations. FRA wants to see that a railroad has built in contingencies for expected, routine problems (e.g., flagging or blocking grade crossings) and rare, but possibly catastrophic, accidents/incidents.

In determining whether a request poses unacceptable risks, FRA will look at acceptable industry standards and available mitigating practices. FRA railroad safety data will be reviewed and FRA may use a focused inspection. FRA requests public comments on ways to differentiate acceptable safety risk versus unacceptable safety risk.

FRA intends to begin its assessment of a request to continue using a one-person



crew operation believing that there are few one-person operations existing currently, and that those operations have not yet raised serious safety concerns. Thus, FRA expects to approve existing operations as long as the railroads with existing operations make a reasonable showing that the safety concerns of reducing crew size were addressed by taking other off-setting actions that likely formed the basis supporting the operation's safe compliance history. A railroad can satisfy FRA's concerns by showing that the railroad has taken a sensible business approach to analyzing the operation and reducing the risks and hazards associated with reducing train crews to less than two crewmembers. However, FRA considers this an approach that puts safety interests ahead of business cost considerations. The expectation is that the approval process will largely pin down the status quo for current one-person train operations that are methodically implemented. FRA will be critical of operations that fail to show careful planning to reduce the likelihood of mishaps and reduce collateral damages in the event of an accident. FRA has promulgated other rules that seek to freeze the status quo, including the following, and expect the approval process contemplated in this rule to work similarly:

1. 49 CFR Part 232—Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment; End-of-Train Devices, (§§ 232.103, 232.305, and 232.603): Adopting AAR's standard for single car air brake tests and ECP braking systems, as well as AAR's general requirements for all train brake systems except where noted. 66 FR 4193, Jan. 17, 2001; 74 FR 25174, May 27, 2009, RIN 2130-AB16.
2. 49 CFR Part 214—Railroad Workplace Safety (§§ 214.113, 214.115, and

214.117): Adopting American National Standards Institute’s (ANSI) standards for protective headwear and footwear for industrial workers in the context of railroad bridge workers. ANSI standards also adopted for occupational and educational eye and face protection when workers face physical, chemical, or radiant agents. 57 FR 28127, Jun. 24, 1992, RIN 2130-AA48.

3. 49 CFR Part 218–Railroad Operating Practices, Subpart F: This subpart was based on a Secretarial initiative to reduce human factor-caused accidents. The rule adopted certain universally accepted railroad operating rules related to the handling of equipment, switches, and fixed derails with the goal that making the operating rules Federal requirements would bring greater accountability. FRA emphasized that an enforcement mechanism is necessary “because prior reliance on the railroad to ensure employee compliance with railroad operating rules without a Federal enforcement mechanism has repeatedly proven to be inadequate to protect the public and employee safety.” 73 FR 8442, 8446, 8449, Feb. 13, 2008, RIN 2130-AB76.
4. 49 CFR Part 224–Reflectorization of Rail Freight Rolling Stock (§ 224.15): Adopting standards for the characteristics of retroreflective sheeting developed by ASTM International, formerly known as the American Society for Testing and Materials (ASTM), which is a globally recognized leader in the development and delivery of international voluntary consensus standards. 70 FR 62166, Oc. 28, 2005, RIN 2130-AB68.
5. 49 CFR Part 229–Railroad Locomotive Safety Standards (§§ 229.205 and

229.217): Adopting AAR's locomotive crashworthiness standard. 71 FR 36912, Jun. 28, 2006, RIN 2130-AB23.

6. 49 CFR Part 238—Passenger Equipment Safety Standards (§§ 238.115, 238.121, 238.125, 238.127, 238.229, 238.230, and 238.311): Adopting the American Public Transportation Association's (APTA) standards for emergency lighting, emergency intercom communication, emergency signage for egress/access of passenger rail equipment, low-location emergency exit path marking, any repair to a safety appliance bracket or support considered to be part of the car body or other structural repair, and single car air brake tests. 64 FR 25660, May 12, 1999, RIN 2130-AA95.

FRA seeks comments on the successes and challenges of these rules and the extent they should be used as a model for this rule.

A railroad may review its one-person operations and find that most or all of these operations are already acceptable to FRA as indicated by other sections in this proposed rule. Obviously, if FRA has proposed a blanket exception to the two-person train crewmember requirement for a particular type of operation industry-wide, it would be unnecessary for the railroad to comply with this proposed section. FRA has encountered difficulty understanding the scope of all the one-person train operations currently being used even though FRA made repeated requests to the RSAC Working Group members for information, AAR and ASLRRA have provided some generalized information, and FRA has surveyed its own regional staff. Each time FRA met with the RSAC Working Group, it seemed that FRA learned about a new type of one-person operation, but without

much detail that would allow FRA to determine that any particular operation was actually safe. Thus, the purpose of this proposed section is to provide FRA with some needed oversight to ensure that railroads are not conducting operations that pose significant safety risks to railroad employees or the general public.

If a railroad wants to continue a one-person operation begun prior to January 1, 2015, proposed paragraph (a) in both options requires that the railroad submit a description of the operation to the Associate Administrator within 90 days of the effective date of this rule. Eleven numbered items are listed under proposed paragraph (a) that a railroad would be required to address in its description of the operation it would like to continue. A railroad should provide a thorough description of the operation, and the 11 numbered items are intended to solicit a complete picture of the risks associated with the operation as well as how much thought the railroad's operations managers have given to whether the operation can provide an appropriate level of safety.

FRA proposes to require railroads to provide the location of the continuing operation with as much specificity as can be provided as to industries served and territories, divisions, or subdivisions operated over. Documentation supporting the locations of prior operations will be favorably reviewed, although not required. This provision goes to proving that an operation is going to be continued, and that a railroad is not falsifying that an operation is in existence when it is actually a completely new operation. For example, documentation could show that the railroad has run a particular one-person train for 3 days per week for 5 years without incident. That kind of information would show the operation actually existed and was safe. A railroad that

could not provide any documentation of a supposedly existing operation would be viewed with skepticism. Maybe, FRA would need to interview employees and supervisors to determine whether the operation actually existed, and to develop the parameters of the operation.

If the railroad has not previously conducted a safety analysis of the one-person train operation that it can use for its submission to FRA, it will be required to do one to comply with this proposed rule under either option. The difference between the co-proposals is that Option 1 requires the safety analysis to be submitted to FRA with the description of the one-person train operation while Option 2 requires that the railroad conduct the safety analysis and make it available to FRA upon request. Railroads that do not maintain separate records on the safety of their one-person crew operations will have to describe the one-person crew operation and should be able to approximate the relevant data. For example, a railroad might describe that on the route under consideration: five one-person trains operate per week on average, each train operates a distance of about 50 miles, only one train per week carries any hazardous materials, and the one-person operation has resulted in two reportable accidents in 10 years, providing the dates of the accidents. A railroad might add that there are no other train operations in the vicinity of these one-person operations when they are active, and that includes on the same track or adjacent track. FRA requests public comments on the extent to which railroads have sufficient records to provide FRA reliable safety analysis or data of their one-person crew operations.

The requirement for a railroad to provide the eleven numbered items listed under

proposed paragraph (a) is intended to solicit significant information that FRA will need to make an objective decision on whether to allow the continuance of an operation established prior to January 1, 2015. Sometimes, FRA should be able to look at the collected information and determine that the operation is in compliance on its face with all applicable rail safety regulations and does not appear to pose any unacceptable risks. Generally, these operations would be low-speed operations, on well-maintained track where the one-crewmember train would have a fairly predictable schedule or one that minimizes fatigue, and would not contain any variables suggesting a catastrophic accident is foreseeable. For example, FRA would expect to approve the continuation of a freight operation under Option 1, or not issue a disapproval under Option 2, under the following circumstances: (1) 70 percent or more of the railroad's carload traffic is non-hazardous materials; (2) the railroad has adopted crew staffing rules and practices to ensure compliance with all Federal rail safety laws, regulations, and orders; (3) the maximum authorized track speed for the operation is 40 mph; (4) the one-person train crewmembers have set daytime schedules with little fluctuation; (5) the one-person train crewmembers average on-duty time is less than 9.5 hours per shift; (6) the operation is structured so that the one-person crewmember would not have to leave the locomotive cab except in case of emergency; (7) the railroad has a rule or practice requiring the one-person crew to contact the dispatcher whenever it can be anticipated that communication could be lost, e.g., prior to entering a tunnel; (8) the railroad has a rule or practice requiring the one-person crew to test the alerter on the lead locomotive and confirm it is working before departure; (9) the railroad has a rule or practice requiring dispatcher

confirmation with the one-person crew that the train is stopped before issuing a mandatory directive; (10) the railroad has a rule or practice requiring a one-person crew have an operable cell phone and radio, and both must be tested prior to departure; and (11) the railroad has a method of determining the train's approximate location when communication is lost with the one-person crew unexpectedly and a protocol for determining when search-and-rescue operations must be initiated. FRA is providing this example for illustrative purposes, to spur understanding of the agency's position and encourage public feedback. Although FRA feels strongly that the example would meet FRA approval, there may be other facts or circumstances about an operation beyond the description provided that would change how FRA viewed a particular operation. FRA encourages the submission of comments describing one-person operations so that FRA can provide additional examples in a final rule.

FRA would be unlikely to approve the continuation of an operation under Option 1, or would likely disapprove an operation under Option 2, when a railroad's one-person operation has a poor safety record compared with the industry average or compared with similar operations with one or multiple crewmembers. Other evidence of a poor safety culture on the railroad might trigger the need for FRA to conduct an investigation to support a determination. If FRA is unsure about any of the other risk factors, FRA will want to initiate its own investigation to assess the likelihood that the operation can be implemented safely. Although FRA is not proposing a requirement that FRA investigate the safety concerns of each one-person operation a railroad wishes to continue, FRA expects to use its discretion and conduct some investigations when FRA is unfamiliar

with the operation or wants to ensure that the railroad has identified all of the hazards. In addition to reviewing records, such an investigation would likely involve FRA personnel interviewing railroad employees, supervisors, managers, and customers. FRA might want to ride along the route to observe the operation in progress, or consider what members of the general public along the right-of-way might be impacted in the case of an accident/incident, especially at public highway-rail grade crossings. Furthermore, FRA personnel might also have information through current or prior observations and audits that could shed light on the safety of a railroad's operations, equipment maintenance procedures, or condition of the railroad's track and signal infrastructure. Evaluating a railroad's safety record and safety culture follow from the TSB of Canada's report following the Lac-Mégantic accident described in the Background section of this NPRM, and from international norms described in the Regulatory Impact Analysis that accompanies this rulemaking and can be found in the docket.

FRA does not expect to request or require existing one-person crew operations to implement additional risk mitigating actions in order to obtain FRA approval unless the process reveals unexpectedly that the operations achieved good safety records based on sheer luck and inadequate planning. If an existing operation was actually severely lacking in existing mitigation measures and the railroad was unwilling to address serious safety concerns, FRA would be justified to deem the operation unsuitable for continuance as provided for in paragraph (b) of both co-proposal options.

In proposed paragraph (b) Option 1, FRA has taken the approach that an explicit approval process for each and every submission is necessary. The proposed paragraph



indicates that FRA expects to issue feedback within 90 days of receipt of the submission. Under some circumstances, FRA may allow the operation to continue but with additional conditions attached. For example, a Class III railroad may want to continue an operation that permits a one-person train to travel 100 miles each day over flat territory where the railroad is maintaining the track to Class 3 standards. As the track class permits speeds for freight trains up to 40 mph, the railroad would like the train to operate at over 25 mph up to the maximum authorized speed for the track even though the specific freight train exception under proposed § 218.131(a) only permits a blanket exception up to 25 mph. During the RSAC Working Group meetings, some railroad members suggested that the 25-mph limitation in the blanket exception in § 218.131(a) could be a disincentive for a railroad to maintain its track to a higher standard than Class 2. As proposed, § 218.133 would provide FRA an opportunity to consider all the circumstances, to exercise some flexibility in permitting safe operations with less than two assigned crewmembers, and assure railroad employees and the general public that railroads are not placing them at unnecessary risk. This approach strikes a balance between rubber-stamping the status quo and prohibiting any operation that does not meet one of the blanket exceptions to the two-person crew requirement.

Although proposed paragraph (b) Option 1 does not contain detailed procedures for how FRA will conduct reviews, a detailed procedural process seems unnecessary. In most instances, FRA expects to review all of the details in the submission and issue written notification that the railroad may continue the operation “as is.” However, FRA recognizes that some operations may pose safety risks for which a railroad has not

accounted by implementing mitigation measures. Under those circumstances, FRA intends for the Associate Administrator to initiate a discussion with the railroad about the operation before making a determination. There may be details of the operation that the railroad can expand upon from its submission that would alleviate FRA's concerns. In other instances, a railroad might offer to modify its operations and submission request voluntarily after a thorough discussion of FRA's concerns. In still other instances, FRA and the railroad may not be able to resolve their differences and FRA will issue written notification explaining what modifications are necessary for continuing the operation or an explanation for why FRA has decided the operation is patently unsafe and cannot be continued even with modifications.

Although FRA is uncertain about whether any existing operations would be inadequate, the background section of this proposal suggests concerns that an operation should address, if it does not already. FRA's overall concerns are (1) whether a railroad's operations with less than two crewmembers are in compliance with all Federal rail safety laws, regulations, and orders and (2) whether the railroad implemented appropriate measures to reduce safety hazards likely to be created by the reduction in crewmembers. With regard to the first concern, FRA must enforce compliance with rail safety requirements. For example, has the railroad ensured that each person who serves as a one-person crew is certified as both a locomotive engineer and conductor? 49 CFR 242.213(d). FRA would be surprised to find such blatant noncompliance in existing operations, but it is certainly possible that FRA has not detected the noncompliance through its regular inspection and investigation program. Currently a railroad does not

have a duty to report to FRA on the aspects of its one-person train crew operations. With regard to the second concern involving a railroad's plans to reduce foreseeable safety hazards likely to be created by the reduction in crewmembers, FRA suggests that each railroad look to the regulatory safety hazards FRA described in the background section of this proposal to see if it addressed those same hazards. For example, a railroad should anticipate that trains will need assistance protecting certain highway-rail grade crossings because of the inconvenience to highway users, emergency responders, or the general public if those crossings are blocked. A railroad that can show FRA that it has an established procedure to quickly unblock or protect crossings that would normally be protected by a second crewmember would satisfy FRA's concern. FRA also raised the concern in the background section of this proposal that a one-person crew would have greater opportunities to operate impaired by alcohol, drugs, or electronic device distraction. A railroad that requires a one-person train crew to report to a supervisor at the beginning or end of a tour of duty, or that periodically stops trains during efficiency testing to check for potential distractions, would allay those concerns. In closing, FRA believes a railroad that is in compliance with all rail safety laws, regulations, and orders, and has addressed foreseeable safety hazards created when a train has less than two crewmembers by making changes to the railroad's operating rules, procedures, or practices, can expect to receive FRA approval to continue its one-person operation.

Proposed paragraph (b) Option 2 differs from Option 1 in that it does not require explicit FRA approval prior to continuing one-person train operations that were conducted prior to January 1, 2015. However, Option 2 proposes a requirement that the

railroad file a description of the operation with FRA prior to continuing the operation. FRA understands that some one-person operations may be seasonal, and others year-round. It is proposed that those railroads that will be operating at the time of the effective date of the rule will be required to file its description either no later than the effective date of the final rule or prior to the first day that the operation is continued after the effective date of the final rule. Option 2 differs from Option 1 in that one-person operations that were operating prior to January 1, 2015, will be presumed to have been operating with an adequate level of safety, unless FRA determines otherwise. An FRA determination disapproving the continuation of any operation would need to contain the facts and rationale relied upon in making that determination. FRA certainly realizes that any final agency decision is an action that is potentially reviewable in Federal court and would need to contain sufficient information to survive legal scrutiny.

FRA is considering how to provide an electronic way to file a description of an operation that a railroad would like to continue without a two-person crew. One option is for FRA to require the submission of all the descriptions to one docket created for the purpose, or to create a docket for each description, at DOT's Docket Operations and at <http://www.regulations.gov>. Another option is to add to the proposed rule an option to electronically file by email or by uploading a document to a secure website. Under this second option, FRA would need to create an internal electronic database to track all of the descriptions and FRA notifications, if any. FRA may consider other options to electronically file or maintain databases of these descriptions. A third option is to publish information available via FRA's public website. FRA has chosen this third option as its

proposal in paragraph (b) of Option 2. In Option 2, FRA also has proposed a requirement that specifies that a railroad has a duty to adhere to any conditions FRA imposes on the railroad's one-person operation. FRA would appreciate any comments suggesting preferences for any particular methods of filing and the need to specify that a railroad must adhere to any conditions imposed by FRA.

FRA is proposing a cut-off period of January 1, 2015, to differentiate existing operations from new operations because it wants to freeze the timeframe based on when the RSAC meetings were held. FRA seeks comments on whether a different date should be used and why.

#### Section 218.135 Special approval procedure

This is the second of two proposed sections in which FRA is co-proposing two options. This proposed section would offer each railroad a procedure to obtain FRA-approval for a start-up method of train operation that does not meet the requirements of the general two-person crew requirements, any of the blanket exceptions, or the continuance of operations prior to January 1, 2015, exception. The special approval procedure has been used in other FRA regulations with success (see, e.g., 49 CFR 232.17), and is, therefore, a proven method for receiving FRA-approval in much less time than the waiver process provided for in 49 CFR part 211 and § 218.7. For a waiver, FRA may need up to 9 months to issue a decision. 49 CFR 211.41(a). In contrast, proposed paragraph (f) in Option 1 states that FRA intends to normally issue a decision under this section's special approval procedure within 90 days. If a railroad submits a petition for special approval of an operation with less than two crewmembers based on a sensible

business plan that adequately addresses the safety hazards, FRA anticipates the agency's analysis would be routine in nature and a decision can quickly be issued. However, if a passenger railroad intends to reduce crew staffing, it must have an approved passenger train emergency preparedness plan or file a waiver request with FRA regarding part 239, passenger train emergency preparedness, in this chapter; however, rather than wait until FRA approves the part 239 plan or waiver request, a passenger railroad is encouraged in proposed paragraph (a) to file a request for special approval of an operation with less than two crewmembers at the same time that it files the part 239 waiver request. FRA can certainly consider both requests at the same time.

Under paragraphs (b) and (e) in Option 2, FRA proposes to allow a railroad to initiate a train operation with less than two crewmembers as long as: (1) the railroad provides FRA a complete description of the operation and (2) the railroad officer in charge of operations signs a statement attesting a safety analysis of the operation has been completed and that the operation provides an appropriate level of safety. In Option 2 under paragraph (e), FRA would not have a need to issue approval decisions as approval would be presumed after the descriptive information and attestation is submitted to FRA. FRA would be able to investigate such operations to evaluate whether they are providing appropriate safety. FRA may halt or attach conditions to the continuance of such operations if it determines that an operation is not providing an appropriate level of safety. FRA will consider the benefits and costs of conditions, as well as safety impacts, and provide the basis for halting or adding conditions to operations to the railroad and the public. This information can be used by other railroads considering initiating train

operations with less than two crewmembers. An FRA determination disapproving a petition for special approval would need to contain the facts and rationale relied upon in making that determination. FRA certainly realizes that any final agency decision is an action that is potentially reviewable in Federal court and would need to contain sufficient information to survive legal scrutiny.

Even with the shorter turnaround time compared to the waiver process, FRA envisions the special approval process contemplated in Option 1 will work similarly to other special approval processes used in existing regulations, although the standard in both co-proposal options of this rule are an appropriate level of safety and FRA's rules generally require an equivalent level of safety for a special approval to be granted. The following are examples of existing special approval processes:

1. Rules of Practice, 49 CFR 211.55: FRA has an overarching special approval procedure for any requests pertaining to safety not otherwise provided for in any FRA rule. These requests will be considered by FRA's Railroad Safety Board. 41 FR 54181, Dec. 13, 1976, No RIN found.
2. Reflectorization of Rail Freight Rolling Stock, 49 CFR 224.15: This special approval procedure provides a mechanism for FRA review of requests to apply, inspect, or maintain retroreflective sheeting "in accordance with an alternative standard providing at least an equivalent level of safety." 70 FR 62166, Oct. 28, 2005, RIN 2130-AB68.
3. Railroad Safety Appliance Standards, 49 CFR 231.33: Procedure for special approval of existing industry safety appliance standards that "provide at least an

equivalent level of safety.” 76 FR 23726, Apr. 28, 2011, RIN 2130-AB97.

4. Brake System Safety Standards for Freight and Other Non-passenger Trains and Equipment; End-of-Train Devices, 49 CFR 232.17: Special approval procedure (found in 49 CFR part 232, subpart A), provides for requests for special approval of a variety of requirements including a plan for the movement of defective equipment and any alternative standard or test procedure for conducting single car air brake tests. The alternative must be “consistent with the guidance . . . and will provide at least an equivalent level of safety or otherwise meet the requirements contained in this part.” 66 FR 4193, Jan. 17, 2001, RIN 2130-AB16.
5. Passenger Equipment Safety Standards, 49 CFR 238.21: Special approval procedure (found in subpart A - General ), provides for requests for special approval of a variety of requirements including fire safety, locomotive fuel tanks, safety appliances, and periodic brake equipment maintenance. The alternative must “provide at least an equivalent level of safety.” 64 FR 25660, May 12, 1999, RIN 2130-AA95.

In Option 1, the proposed special approval procedure contains three safeguards to ensure that interested parties are involved in the review process. First, proposed paragraph (b)(4) requires a statement affirming that the railroad has served a copy of the petition on the president of each labor organization that represents the railroad’s employees subject to this part, if any, together with a list of the names and addresses of the persons served. Second, proposed paragraph (d) requires FRA to publish a notice in the Federal Register concerning each petition. Third, proposed paragraph (e) provides a



30-day comment period for any person who wishes to file a comment on the petition.

Under paragraph (b) of both co-proposal options, the petition for special approval of a train operation with less than two crewmembers must contain certain basic information regarding the petitioner's contact information. Both co-proposal options contain the requirements for what the substantive portion of the petition must contain. All of the information requested in proposed paragraphs (b)(2) and (b)(3) of Option 1 are intended to give FRA a detailed understanding of the operation and why the railroad believes the operation is safe.

The proposed requirements for a railroad's submission under Option 2 differs from Option 1 in that a safety analysis must be completed, but does not have to be submitted with the description of the one-person operation. Under Option 2, FRA proposes to more greatly rely on each railroad's judgment and incentives to provide safe operations. A safety officer would be required to provide a statement that the railroad had conducted a safety analysis of the start-up operation which would address potential safety hazards and regulatory compliance concerns associated with the one-person operation and that the officer believes the operation would have an appropriate level of safety. Because of the proposed attestation, FRA is proposing to allow start-up one-person operations prior to FRA's review and approval as proposed in Option 1. However, FRA may request that safety analysis and a railroad will be obligated to provide it.

Option 2 is proposed to permit railroads to begin operations with less than two crewmembers without FRA approval and places the burden on FRA when reviewing

railroads' applications to justify that the operation does not provide an appropriate level of safety. Under Option 2, in response to a railroad's application to use less than two crewmembers on an operation, which would include a certification from the railroad that it has conducted a safety analysis and has determined that the operation provides an appropriate level of safety, FRA would need to identify specific safety hazards created by or exacerbated by use of less than two crewmembers—supported by specific empirical, statistical, or other similar types of evidence—in order to overcome the railroad's certification. Option 2 may place a slightly higher burden on FRA than Option 1 depending on the involved safety hazard and because FRA may need to review and observe the actual operation and will need to consider information gathered on the already existing operation.

In addition, because under Option 2 FRA would be overriding a railroad's safety certification if FRA were to attach conditions to or halt an operation, FRA considered including language in the Option 2 proposal which would require FRA to "demonstrate" instead of make a "determination" that the operation does not provide an appropriate level of safety to capture a higher evidentiary burden on FRA. However, FRA chose not to include this term in the Option 2 proposal because FRA believes it would place too high of an evidentiary burden on FRA and would create significant uncertainty as to what FRA must establish in order to attach conditions to or halt an operation. While FRA provides a presumption that the specifically identified one-person operations contained in §§ 218.127 through 218.131 of the proposal provide an appropriate level of safety, FRA does not believe such a presumption is appropriate under either Option 1 or 2 of the

proposal as operations utilizing either option have never existed and have never been operated with less than at least two crewmembers. With that said, FRA agrees that under either Option 1 or 2, FRA would need to provide statistical, empirical, or other similar types of specific evidence to justify a determination that a particular operation does not provide an appropriate level of safety. Such evidence must be able to withstand judicial review under an “arbitrary and capricious” standard established by the Administrative Procedure Act. 5 U.S.C. 706. Nevertheless, Option 2 may elevate FRA’s evidentiary burden. Interested parties should provide their views on what FRA’s evidentiary burden should be under the two proposed options and whether the suggested language is adequate or whether FRA should instead include the language that FRA “demonstrate” that an operation would not provide an appropriate level of safety, or whether there is alternative language which should be included instead.

Under both options 1 and 2, if FRA determines that an existing or start-up operation with less than two crewmembers requires additional conditions for it to attain an appropriate level of safety, or that an operation cannot attain an appropriate level of safety regardless of additional conditions and therefore cannot operate or must be halted, FRA will provide the specific empirical, statistical, or other similar evidence justifying FRA’s determination in a decision statement. The statement will also document the benefits and costs of conditions and alternatives that FRA considered, as well as the safety risk factors associated with the operation.

Under both options, the proposed rule requires that FRA provide “the specific reason(s) and rationale for the decision.” The proposal thus requires that any FRA

decision to attach conditions to or halt or prevent an operation must include a detailed description—supported by empirical, statistical or other similar types of specific evidence—of how the operation falls short of the appropriate level of safety standard. In the decision statement, FRA will identify the specific hazard(s) that are presented by the introduction of the operation that would not exist if the operation used a second crewmember meeting the proposed “roles and responsibilities” definition, or the specific hazard(s) that already existed for that operation which would be exacerbated if the operation did not use a second crewmember meeting the proposed “roles and responsibilities” definition. Sometimes the specific hazard(s) will be self-evident and it will be unnecessary for FRA to provide in the decision statement empirical, statistical, or other types of similar evidence to justify the safety problem. One such example is stopping and flagging highway-rail grade crossings where there has been an activation failure and no second crewmember is available to dismount from the locomotive and flag the crossing for the protection of highway users. FRA would want to see that the railroad had a plan for addressing that situation, especially if the train will traverse crossings in populated areas where the train could potentially block highway user traffic for extended periods of time. An existing FRA regulation found at 49 CFR part 234 contains the restrictions and requirement for a railroad to handle signal activation failures and the circumstances when a flagger must be present. That FRA grade crossing safety regulation also requires a timely response by the railroad to such malfunctions. 49 CFR 234.103. Thus, FRA would expect that a railroad’s plan would identify operating rules and procedures that it has in place and would describe its staging or location of personnel

to ensure that proper personnel are present in a timely fashion to flag the crossing before permitting a train to traverse the crossing. Currently, if an existing one-person operation is involved in an activation failure circumstance the train could not proceed across the crossing until someone appropriately trained in flagging arrives to flag the crossing (in current two-person operations the second crewmember is trained and would flag the crossing).

Other hazards may not be self-evident. In such cases, FRA's decision statement would include the specific empirical, statistical, or other type of similar evidence justifying FRA's determination. For example, if FRA were to decide to halt or attach conditions to an operation due to a concern about the train's speed (and the train's speed does not exceed maximum limits established for the class of track), FRA's decision statement would include the empirical or other similar evidence to justify why the less than two person train traveling at its desired speed would not provide an appropriate level of safety. Moreover, and as described further below, if FRA were to condition approval based on the operation lowering speed (or any other condition), the decision statement would address the costs and benefits of the lower speed condition, as well as alternatives considered by FRA. Similarly, if FRA were to decide to halt or attach conditions to an operation due to a concern about the crew's work schedule, FRA's description would identify the specific statistical, empirical, or other similar types of evidence to justify why the operation's schedule would not provide an appropriate level of safety. If FRA were to condition approval based on the operation using a different work schedule (or any other condition), the decision statement would address the costs and benefits of the condition,

as well as alternatives considered by FRA. These examples are not exhaustive. In all cases where safety hazards are not self-evident, FRA would provide in the decision statement the empirical, statistical, or other type of evidence justifying its determinations, and the benefits and costs of the condition(s) imposed on a railroad and alternatives considered.

In addition, if FRA were to decide to require an operation to use a particular technology or adopt a practice (or any combination of technology or practice) as a condition for operating with less than two crewmembers, the decision statement would identify the specific hazard that the technology or practice is intended to address and cite the evidence that justifies the technology or practice as an effective means for addressing the risks of the hazard. If FRA were to decide to halt or prevent an operation because FRA believes it cannot provide an appropriate level of safety even with additional conditions, the decision statement would describe the specific hazard(s) that present the risk, the specific interventions that FRA considered to address the hazard(s) (including the benefits and costs of the interventions), and an explanation for why FRA decided that no intervention could effectively address the hazard(s) and provide for an appropriate level of safety. FRA will engage the railroad in making any such determination and consider alternatives and analysis provided by the railroad, which will also be documented in the decision statement.

Whether an existing hazard or newly created potential hazard, FRA's decision statement will identify whether the operation would likely be approved if specific conditions are met. FRA may need to add a disclaimer to a decision that additional

conditions may be added if not met within a certain timeframe, in the rare situation that additional hazards are identified between the time of the original special approval application and a revised application. At this time, FRA does not foresee that any particular existing or start-up operation could not meet the appropriate level of safety standard with some conditions added, although some railroads may choose not to accept FRA's conditions and could certainly suggest to FRA a counter-proposal. In each case, FRA's decision statement will include the justification for halting or adding conditions to operations, explain how particular safety and operational factors are weighed in making the decision, and provide evidence that is relied upon.

FRA's decision statement will also document the benefits and costs that FRA considered in making its determination. The level of detail and analysis of benefits and costs will depend upon the magnitude of cost of any condition(s) that FRA attaches to a particular operation. For example, if FRA requires an operation with significant resources to use a particular technology that has a one-time cost of \$500 and minimal maintenance costs, the decision statement would include an estimate of that cost, at least a qualitative discussion of the technology's benefits supported by evidence, and an explanation for why FRA believes those benefits justify the cost of the technology. On the other hand, if FRA requires an operation to adopt a practice that would impose a significant cost, the statement would provide a detailed analysis of the benefits and costs of the technology or practice, and an explanation for why FRA believes the condition(s) result in net societal benefits. FRA will allow railroads an opportunity to respond to the benefit and cost information that FRA considers in making its determinations. If FRA

does not use or agree with the information provided by railroads, FRA will explain why in its decision statement. Economic information would ideally be used by the railroad to provide more cost-effective alternatives to address FRA's safety concerns. FRA seeks public comments on better ways to ensure that the information presented in the decision statement effectively justifies FRA's determinations and provides railroads meaningful guidance on how train operations using less than two crewmembers can provide an appropriate level of safety.

Under Option 1, FRA wants to collect sufficient information to be assured that the railroad has considered how a one-person crew could potentially perform tasks typically performed by a second crewmember, either with or without technological safeguards. Certainly, FRA is concerned with preventing or significantly mitigating the consequences of accidents, and each railroad petitioner should focus on addressing accident prevention issues in a petition. When a railroad files a petition for special approval, attention should be given to not just what the technology can do, but that the railroad has considered the additional burden placed on the one-person crew. Railroads are also advised to consider task overload, situational awareness concerns, as well as fatigue factors. A railroad that can show it has taken a sensible business approach to analyzing the operation and reducing the risks and hazards associated with reducing train crews to less than two crewmembers will likely satisfy FRA's concerns and can expect to have a special approval petition approved. FRA will certainly look more favorably on petitions that take a holistic approach to the safety of the operation when deciding whether to approve a petition for special approval.



In the preamble discussion of how this proposed rule differs from FRA's suggested recommendations to the RSAC, FRA explained that it considered whether to adopt an explicit exception from the two-person crew staffing requirement whenever a railroad had implemented a PTC system with certain capabilities, or some other combination of technologies and other operating safeguards. FRA indicated during the RSAC discussions that it was willing to consider safeguards such as: electronically controlled pneumatic brakes; appropriate installation of wayside detectors, especially hot box, overheated wheel, dragging equipment, and wheel impact load detectors; enhanced scheduled track inspections with track inspection vehicles capable of detecting track geometry and rail flaws; implementation of a fatigue management system with set work schedules; and procedures for providing a one-person train operation with additional persons when necessary for en route switching, crossing protection, or any required train-related inspection. FRA estimates the cost to railroads from adding these safeguards as a condition of FRA approval of starting up a one-person crew operation would be \$580,000, and benefits are unquantified. Of course, the problem with any list like this one is that it would likely not be inclusive of all the various types of mitigation measures a railroad could implement that have the potential to compensate for the loss of a second crewmember. Additionally, without FRA evaluations, it would be difficult to assess whether a railroad has established effective training and a strong safety culture, which are essential for improving safety reliability when technology cannot ensure a high degree of safety.

FRA is reluctant to rely solely on the presence of PTC to ensure new one-person

crews are safe in all types of operations and environments because there are a number of situations where PTC technology will demand more tasks from the train crew, not substitute for the tasks that would be carried out by a second crewmember, or fail to make full use of crew resource management principles. In the background section, research is described that explains how PTC cannot account for all the physical and cognitive functions that a conductor currently provides. Based on the research already described and FRA's understanding of PTC systems, PTC does not: (1) check the engineer's alertness, which includes ensuring that the engineer is not fatigued, under the influence of any controlled substance or alcohol, or distracted by using a prohibited electronic device; (2) fill in the knowledge or experience gaps of the sole crewmember about the physical characteristics of the territory the train is operating over, how to address a particularly difficult operating problem, or help in diagnosing and responding to train problems and other exceptional situations; (3) review, comprehend, and accept consist and authority data while the train is in motion; (4) assist in the physically demanding task of securing a train with hand brakes, typically at the end of a tour of duty when the crew is looking forward to going off-duty; (5) assist in protecting highway-rail grade crossings or breaking up the train at such crossings to avoid blocking them from highway users for extended periods; (6) update train consist information arising from the set out and pickup of cars; (7) protect the point, i.e., the leading end of the train movement, during shoving or pushing movements where the locomotive engineer is not operating from the leading end of the leading locomotive in a position to visually determine conditions in the direction of movement; (8) assist a locomotive engineer when

complying with “restricted speed,” which requires a locomotive engineer to stop the train within one half the engineer’s range of vision to avoid on-track equipment and misaligned switches; or (9) assist the train if the PTC system fails en route or enters non-PTC territory. Furthermore, the research described previously suggests that because the PTC technology may require locomotive engineers to focus more of their attention on in-cab displays, it will reduce their ability to monitor activity outside the cab and raises a question about whether the engineers will lose any situational awareness in relation to the coherent mental picture (i.e., the situation model) of where the engineer perceives the train to be based on prior experience. However, FRA believes that PTC offers a considerable increase in the level of safety of railroad operations and there may be some types of operations for which the use of PTC provides an adequate level of safety with a single person crew. FRA’s approval of a one-person operation with PTC would most likely hinge on whether the railroad addressed foreseeable safety hazards created when a train has less than two crewmembers or when PTC fails to work properly. FRA suggests that each railroad look to the regulatory safety hazards FRA described in the background section of this proposal to see if it addressed those same hazards. For example, a railroad should anticipate that trains will need assistance protecting certain highway-rail grade crossings because of the inconvenience to highway users, emergency responders, or the general public if those crossings are blocked. A railroad that can show FRA that it has an established procedure to quickly unblock or protect crossings that would normally be protected by a second crewmember would satisfy FRA’s concern. FRA also raised the concern in the background section of this proposal that a one-person crew would have

greater opportunities to operate impaired by alcohol, drugs, or electronic device distraction. A railroad that requires a one-person train crew to report to a supervisor at the beginning or end of a tour of duty, or that periodically stops trains during efficiency testing to check for potential distractions, would allay those concerns. It will certainly help a railroad if it can present evidence of a strong safety culture and a compliance/accident history that compares well to other railroads in its class.

In closing, under Option 1, FRA believes a railroad can expect to receive FRA's special approval for a one-person train crew operation when the railroad has established that it: (1) is in compliance with all rail safety laws, regulations, and orders related to the proposed one-person operation; (2) has set forth plans to address foreseeable safety hazards created when a train has less than two crewmembers by making changes to the railroad's operating rules, procedures, or practices as necessary; and (3) has an established strong safety culture and favorable compliance/accident history.

Moreover, the proposed special approval procedure is sufficiently flexible that it would allow a railroad to tailor its petition to address the specific operation for which it seeks approval. The NPRM does not suggest that PTC is a pre-condition for seeking special approval of a train operation with less than two crewmembers, and FRA is wary of creating a list where certain items may not be applicable to assuring that a particular operation reached an appropriate level of safety. Each railroad should have the ability to make its case that it has considered the unique circumstances of its operation and has tailored safeguards accordingly. The above listing of technologies and safeguards merely provides examples of items a railroad might consider implementing or utilizing based on

the complexity and nature of the operation for which an exception is sought. A railroad's safety analysis of its own operation will help identify operational weaknesses and allow the railroad to choose the remedies that will allow it to assure FRA that an appropriate level of safety can be maintained with less than two train crewmembers.

Last year, BNSF and the United Transportation Union (UTU) developed the concept for a one-person operation, but the operation was voted down by UTU's members. The concept contained several positive attributes such as (1) limiting the operations to defined territories, (2) providing one-person crewmembers with regular and predictable work schedules, and (3) designing the schedules so that one-person crews would not have to spend any time away from a home terminal, thus allowing the person to sleep at home when off duty. Although FRA was consulted on this potential operation, FRA did not have an enforcement mechanism to require the parties to discuss it with FRA prior to implementation. FRA had some concerns with the logistics of the operation and whether all aspects of the operation would be in compliance with all Federal rail safety laws, regulations, and orders. Potentially, one or more obstacles could be overcome by issuance of waivers or changes to the concept. The parties had not completely thought through some aspects of this potential operation and how potentially foreseeable emergency events would be addressed with only one crewmember. FRA viewed these obstacles as temporary roadblocks that the parties could overcome with planning and implementation of new processes. FRA's approach to the BNSF/UTU concept exemplifies how FRA views its role in this proposed rule. That is, FRA will ensure that each railroad has adequately addressed the safety concerns associated with

using less than two crewmembers on a train before issuing special approval for such an operation. As BNSF and UTU showed some flexibility on considering certain aspects of the proposed operation, FRA does not believe that its concerns would have prevented the project from going forward had the UTU's members approved the operation.

Although an absolute assurance of FRA approval would certainly have benefits, the proposed requirements for petitioning FRA are not overly burdensome. FRA plans to approve operations with less than two crewmembers where a railroad provides a thorough description of that operation, has sensibly assessed the risks associated with implementing it, and has taken appropriate measures to mitigate or address any risks or safety hazards that might arise from it. A prudent railroad would consider such a safety analysis prior to implementation, with or without this proposed rule. This rulemaking merely provides FRA with the opportunity to confirm that each railroad is following a sensible business model. FRA seeks comments on its special approval procedure options and would appreciate suggestions for improving this proposed process or suggesting alternatives.

Once approved, a petition would likely be valid indefinitely. FRA does not plan to require a railroad to come in at regular intervals for extensions of the approval, as FRA does in the waiver context. A railroad that wishes to deviate from an FRA-approved petition, however, will need to come back to FRA and request approval for any modification to the operation that is not covered by the prior approval. For example, if FRA has approved a one-person operation at 25 mph and the railroad has invested resources to improve the track, the railroad would need special approval to increase the

speed of that operation. The railroad would need to consider in its new petition how the dangers of possibly increasing the speed of the one-person operation have been addressed in its safety analysis.

FRA is considering whether it would be helpful to specify an electronic way to file special approval petitions and comments with FRA. One option is for FRA to require the submission of all the petitions to one docket created for the purpose, or to create a docket for each petition, at DOT's Docket Operations and at <http://www.regulations.gov>. Another option is to add to the proposed rule an option to electronically file by email or by uploading a document to a secure website. Under this second option, FRA would need to create an internal electronic database to track all of the petitions, comments, and FRA notifications. A third option is to publish information available via FRA's public website. FRA has chosen this third option as its proposal in paragraph (d) of Option 2. In paragraph (f) of Option 2, FRA has also proposed a requirement that specifies that a railroad has a duty to adhere to any conditions FRA imposes on the railroad's one-person operation. FRA may consider other options to electronically file or maintain databases of petitions for special approval. FRA would appreciate any comments suggesting preferences for any particular methods of filing and the need to specify that a railroad must adhere to any conditions imposed by FRA. However, in all instances under both co-proposal options, FRA will contact the petitioner and other interested parties whenever it denies a petition or reopens consideration of the petition. In addition, under co-proposal Option 1, FRA will also contact the petitioner and other interested parties whenever it grants a petition.

FRA is considering whether option 2 should prohibit railroads from starting operations that use fewer than two crewmembers until a public notice and comment process has occurred. For instance, for new operations, option 2 could include a 30 day delay between public notice of an operation with fewer than two crewmembers and the initiation of that operation. Such a requirement would ensure the public has had an opportunity to raise safety concerns before a new operation starts. However, it could also delay the start of more efficient train operations that do provide appropriate safety. FRA requests public comment on whether including such a prohibition in option 2 is justified. Specifically, what are the advantages and disadvantages of including such a requirement? If a delay is imposed to allow for public comment, how long should the public comment process be? Should such a requirement apply only to certain types of operations? If so, which ones? Should public notice be provided by a federal register notice, a posting on FRA's public web site, or in some other way? What impacts would such a requirement have on railroad operations? If FRA uses the Federal Register to provide public notice, it could take FRA up to 60 days from receiving the description from railroads as proposed in § 218.133(a) and § 218.135(b) of option 2 to post the notice. If FRA uses its website to provide public notice, FRA expects that it would ordinarily provide public notices within two weeks of receiving the description from railroads as proposed in § 218.133(a) and § 218.135(b) of option 2. Should there be a requirement that FRA publicly post the railroad's submission within a certain amount of time of receiving it? If so, what is the appropriate amount of time?

Appendix A to Part 218—Schedule of Civil Penalties



If this proposed rule becomes a final rule, FRA intends to amend appendix A, the schedule of civil penalties, accordingly. This rule proposes to add a subpart to existing part 218. The existing part explains when FRA may assess a civil penalty. 49 CFR 218.9. FRA has also published the agency's policy concerning the enforcement of the Federal railroad safety laws. 49 CFR part 209, app. A.

## **VII. Regulatory Impact and Notices**

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

This proposed rule has been evaluated in accordance with existing policies and procedures, and determined to be significant under Executive Order 12866, Executive Order 13563, and DOT policies and procedures. 44 FR 11034, Feb. 26, 1979. FRA has prepared and placed in the docket a Regulatory Impact Analysis addressing the economic impacts of this proposed rule. The RIA presents estimates of a cost range likely to occur over the first ten years of the proposed rule as well as estimates of the benefits that would be will be necessary for the proposed rule to breakeven over the same timeframe. Non-quantifiable benefits are also presented. Informed by its analysis of the economic effects of this proposed rule, FRA believes that this proposed rule will result in positive net benefits. FRA believes that the proposed rule will help ensure that train crew staffing does not result in inappropriate levels of safety risks to railroad employees, the general public, and the environment, while allowing technology innovations to advance industry efficiency and effectiveness without compromising safety. The proposal contains minimum requirements for roles and responsibilities of the second train crewmember on

certain operations and promotes safe and effective teamwork. FRA does not expect the requirements for roles and responsibilities will have any impact on existing operations because all operations that use two-person crews are compliant, however FRA requests comments on this expectation.

Compliance costs associated with this proposed rule include the addition of the labor hour equivalent of about one to two additional crewmembers nationwide to certain train movements for existing (an estimated cost of roughly \$120,000 to \$200,000 annually over 10 years), off-setting actions implemented by railroads because of this rule in order to use fewer than two-person crew operations, and information submission and data analysis. FRA estimated a 10-year cost range which would be between \$7.65 million and \$40.86 million, undiscounted. Discounted values of this range are \$5.19 million and \$27.72 million at the 7-percent level.

FRA expects benefits to result from improved post-accident/incident emergency response and management due to the actions of crewmembers nationwide, sustained safety resulting from the additional crew reporting troubled employees due to drug and alcohol use, and compliance with restrictions on electronic device use in place to prevent distraction, and potential avoidance of a high-consequence train accident. FRA estimates the benefit associated with sustained drug and alcohol safety levels and the level of improved emergency response necessary to break even. In addition there may be business benefits from allowing the use of innovative practices and technology to reduce crew size when safety is not compromised. As railroads methodically go through the rigor of analyzing the risk posed by crew size reductions they may also identify a larger

pool of train operations for crew size reduction.

In analyzing the proposed rule, FRA has applied “Guidance on the Economic Value of a Statistical Life in US Department of Transportation Analyses,” July 2014. This policy updates the Value of a Statistical Life (VSL) to \$9.2 million and provides guidance used to compute casualty mitigation benefits in each year of the analysis based on forecasts from the Congressional Budget Office of a 1.18 percent annual growth rate in median real wages over the next 10 years. FRA also adjusted wage based labor costs in each year of the analysis accordingly. Real wages represent the purchasing power of nominal wages. Non-wage inputs are not impacted. Labor costs and avoided injuries and fatalities, both of which in turn depend on wage rates, are key components of the costs and benefits of this proposed rule. FRA is confident that the benefits outlined in this document would exceed the costs. This rule is expected to at least break even. Preventing a single fatal injury would exceed the break-even point in the low range and 5 fatalities at the high range. Eighteen moderate injuries or four severe injuries or two critical injuries would also result in at least break even at the low range. Seventeen severe or eight critical would be the break-even minimum at the high range. The proposed rule will help ensure that train crew staffing does not result in inappropriate levels of safety risks to railroad employees, the general public, and the environment, while allowing technology innovations to advance industry efficiency and effectiveness without compromising safety. The proposal contains minimum requirements for roles and responsibilities of the second train crewmember on certain operations and promotes safe and effective teamwork. This rule would break even through prevention of a fatal

injury or high-consequence accident, any one of which alone occurring over a 10-year period would justify the costs. Other accident damages may also be contained. There are several post-accident situations in which the actions of a second crewmember resulted in more timely and appropriate emergency response, which in turn likely contained the damages resulting from the accident.

FRA also conducted a sensitivity analysis using VSL of \$5.2 million and \$13 million. Applying a VSL of \$5.2 million, avoidance of 2 fatalities, 4 severe injuries, or 7 serious injuries would justify the 10-year implementation costs. In contrast, applying a VSL of \$13 million, avoidance of 1 critical injury, 1 fatality, 2 severe injuries, or 4 serious injuries would justify the 10-year implementation costs.

Given the risk associated with single train crews operating trains carrying high risk commodities, FRA believes it is reasonable to expect that consideration of crew staffing level impacts on safety and implementation of any necessary mitigation to help ensure risk is appropriately mitigated will yield safety benefits that will exceed the costs.

FRA conducted sensitivity analysis of its first co-proposal using a 20-year time horizon. FRA estimates that the cost range of its co-proposal would be \$7.44 million to \$36.25 million over this timeframe using a 7-percent discount rate, and \$11.94 million to \$50.71 million using a 3-percent discount rate.

### Alternatives

FRA invites public comments on alternatives to the co-proposals and information collection proposals. One alternative is for FRA to not require railroads using or aspiring to use less than two person crews to attest but establish a data-collection process in which

FRA would collect the data necessary to identify problematic one-person operations, conduct further review of an operation if warranted by the data, and use existing emergency authority to take action against an unsafe one-person crew operation. The advantages of this alternative is that it would provide FRA comprehensive information about one-person crew operations and allow railroads the flexibility to continue or start up less than two-person crews without incurring the cost of FRA approval.

Another alternative is to adopt the above alternative and also require FRA approval only for one-person operations carrying certain amounts of hazardous materials. Transport Canada adopted a similar approach except that it banned use of less than two-person crews on all trains carrying dangerous goods. The advantage of this alternative is that it would provide FRA comprehensive information about one-person crew operations and require FRA approval of the most high risk trains: those carrying hazardous materials.

A third alternative is to adopt the first alternative and also require a special approval process for all aspiring less than two person crew operations operating in high-threat urban areas and carrying certain amounts of hazardous materials. The advantages of this alternative is that it would provide FRA comprehensive information about one-person crew operations, allow FRA to intervene against problematic crews, and allow one-person crew operations to continue or start up without FRA approval as long as they do not operate in places where large numbers of people congregate.

B. Regulatory Flexibility Act and Executive Order 13272

To ensure that the impact of this rulemaking on small entities is properly

considered, FRA developed this proposed rule in accordance with Executive Order 13272 (“Proper Consideration of Small Entities in Agency Rulemaking”) and DOT’s policies and procedures to promote compliance with the Regulatory Flexibility Act (5 U.S.C. 601 et seq.).

The Regulatory Flexibility Act requires an agency to review regulations to assess their impact on small entities. An agency must conduct a regulatory flexibility analysis unless it determines and certifies that a rule is not expected to have a significant economic impact on a substantial number of small entities.

As discussed in the preamble above, FRA is proposing to establish a regulation with minimum requirements for the size of train crew staffs depending on the type of operation. A minimum requirement of two crewmembers is proposed for those operations that pose significant safety risks to railroad employees, the general public, and the environment. This proposed rule would also establish minimum requirements for the roles and responsibilities of the second train crewmember on a moving train, and promote safe and effective teamwork. FRA is certifying that this proposed rule will result in “no significant economic impact on a substantial number of small entities.” The following section explains the reasons for this certification.

#### Description of Regulated Entities and Impacts

The “universe” of the entities under consideration includes only those small entities that can reasonably be expected to be directly affected by the provisions of this rule. In this case, the “universe” will be Class III freight railroads that carry out train operations with one-person crews.

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.” “Small entity” as defined by the SBA is a small business that is independently owned and operated, and is not dominant in its field of operation. Additionally, section 601(5) defines “small entities” as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations less than 50,000.

Federal agencies may adopt their own size standards for small entities in consultation with SBA and in conjunction with public comment. Pursuant to that authority, FRA has published a final policy that formally establishes “small entities” as railroads which meet the line haulage revenue requirements of a Class III railroad.<sup>5</sup> The revenue requirements are currently \$20 million or less in annual operating revenue. The \$20 million-limit (which is adjusted by applying the railroad revenue deflator adjustment)<sup>6</sup> is based on the Surface Transportation Board’s (STB) threshold for a Class III railroad carrier. FRA is using the STB’s threshold in its definition of “small entities” for this rule.

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<sup>5</sup> See 68 FR 24891, May 9, 2003; 49 CFR part 209, app. C.

<sup>6</sup> For further information on the calculation of the specific dollar limit, please see 49 CFR part 1201.

There are about 671 Class III railroads on the general system of rail transportation that this proposed rule would apply to resulting in costs associated with adding a second crewmember to train operations under proposed § 218.125 if they do not qualify for an exception under proposed §§ 218.127 or 218.131. Based on information available from the internal regional survey regarding railroad eligibility for exception, and crew size for Class III railroads, coupled with information in the 2011 waybill sample regarding railroads with one-person operations carrying high hazard commodities, FRA estimates that at least 88.9 percent of the affected Class III railroads would be able to qualify for one of the proposed exceptions. Class III railroads moving the high-risk commodities in quantities described in proposed § 218.125(c)(1)–(2) would not qualify for the exception and would be required to add a second crewmember and be impacted by the proposed regulation.

Seventy five Class III railroads (11.1 percent) would not qualify for an exception based on operating speed and key train operations. Fourteen Class III railroads operate with single-person crews and could be impacted to the extent they carry high risk commodities. FRA estimates that Class III railroads with single-person crews that do not qualify for an exception and will incur regulatory costs associated with an estimated average of an additional 241 labor-hours per year to add a second crewmember. The actual level of increase would vary proportionally with the level of riskier products carried and may represent a different portion of total operations depending on the level of overall operations. Information from FRA's internal survey indicates that the 14 Class III railroads with single-crew operations have annual operations totaling an average of



73,491 labor-hours. Based on the 241 labor-hours per year average cost this means that impacted railroads would have to increase train crew costs by 0.33 percent (0.33 percent increase in labor hours) on average. Based on information available regarding eligibility for exception, and crew size coupled with information in the 2011 waybill sample regarding railroads with one-person operations carrying crude oil or ethanol, FRA believes that three to five Class III railroads would thus be impacted by the proposed rulemaking. These results indicate that the proposed rulemaking will not result in a significant economic impact on a substantial number of small entities.

In addition, FRA notes that several of the 14 Class III railroads with single-person operations are subsidiaries of much larger Class I railroads or well-established holding companies that have revenues in excess of the adjusted \$20 million threshold for this analysis.

Pursuant to the Regulatory Flexibility Act, 5 U.S.C. 605(b), the FRA Administrator certifies that this proposed rule would not have a significant economic impact on a substantial number of small entities. FRA requests comment on both this analysis and this certification, and its estimates of the impacts on small railroads.

C. Paperwork Reduction Act

The information collection requirements in this proposed rule are being submitted for 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 current and new information collection requirements are detailed below, and the estimated time to fulfill each requirement is as follows:

CFR Section/Subject	Respondent Universe	Total Annual Responses	Average Time per Response	Total Annual Burden Hours
217.7 - Copy - FRA - Operating rules, timetables, Class I & II RRs - Amendments/Revisions - Copy of operating rules/timetables, etc. by Class III - Amendments/Revisions by Class III Railroads	2 new railroads  55 railroads 5 new railroads  673 railroads	2 submission  165 revisions 5 submission  2,019 rev./ amendments	1 hour  20 minutes 55 minutes  15 minutes	2 hours  55 hours 5 hours  505 hours
217.9 – RR Testing Officer Qualification - Records of Qualification - Written Prog. of Operational Tests - Records of Operational Tests/Inspections - Amendments/Revisions - Quarterly Review of Accident/Incident Data/Prior Op. Tests /Inspections - Designated Officers & Conduct of 6 Month Review - Designated Officers & Conduct of Six Month Review by Passenger/Commuter Railroads - Records of Periodic Reviews - Annual Summary on Operational Tests/Insp. - FRA Disapproval of RR Program of Operational Tests/Insp. & Response by RR - Amended Program Documents	722 railroads 5 new railroads 722 railroads  55 railroads 722 railroads  722 railroads Amtrak + 23 Railroads  722 railroads 61 railroads 722 railroads 722 railroads	4,732 records 5 programs 9,188,700 rcd  165revisions 140 reviews  70 IDs + 140 reviews 27 IDs + 54 reviews  334 records 97 summary records 5 supporting documents  5 amended documents	2 minutes 9.92 hours 5 minutes  70 minutes 2 hours  5 seconds + 2 hours 5 seconds + 2 hours  1 minute 61 minutes  1 hour  30 minutes	158 hours 50 hours 765,725 hour  193 hours 280 hours  280 hours 108 hours  6 hours 99 hours  5 hours  3 hours
217.11 – Periodic Instruction of Program Employees on Oper. Rules - New RR -- Development of Program of Operating Rules Instruction - Amendments/Revisions to Operating Rules Instruction Program	722 railroads 5 new railroads 722 railroads	130,000 instr. employees 5 Programs 110 revisions	8 hours 8 hours 30 minutes	1,040,000 hr. 40 hours 55 hours
218.95 - Instruction, Training, Examination - Records - Response to FRA Disapproval of Program (Written or Oral Submission) - Programs Needing Amendment	722 railroads 722 railroads 722 railroads	98,000 record 5 responses 5 amended programs	5 minutes 1 hour 30 minutes	8,167 hours 5 hours 3 hours

218.97 - Written Procedures on Good Faith Challenges by Employees Re: Actions	722 railroads	Already completed	N/A	N/A
- Employee Copy of Written Procedures	722 railroads	4,732 copies	6 minutes	473 hours
- Good Faith Challenges by RR Employees	98,000 Employees	15 challenges	10 minutes	3 hours
-RR Responses to Employee Challenge	722 railroads	15 responses	5 minutes	1 hour
- Immediate Review of Employee Challenge	722 railroads	5 immediate reviews	30 minutes	3 hours
- RR Officer Explanation of Federal Law Protection Against Retaliation	722 railroads	5 explanation	1 minute	.08 hour
- Documented Protest by RR Employee	722 railroads	10 written protests	15 minutes	3 hours
- Copies of Protests	722 railroads	10 copies	1 minute	.17 hour
-Further Reviews	722 railroads	3 reviews	15 minutes	1 hour
- Written Verification Decision to Employee	722 railroads	10 decisions	10 minutes	2 hours
- Copy of Written Procedures at RR Headquarters	722 railroads	722 copies of procedures	5 minutes	60 hours
-Copy of Verification Decision at RR Headquarters & Division Headquarters	722 railroads	20 copies	5 minutes	2 hours
218.99 - Shoving or Pushing Movements	722 railroads	36 revisions	1 hour	36 hours
- Operating Rule Modifications	100,000 Employees	180,000 job briefings	1 minute	3,000 hours
- Locomotive Engineer Job Briefing Before Movement	100,000 Employees	87,600,000 decisions + 87,600,000 signals	1 minute + 1 minute	2,920,000 hours
- Point Protection Determinations & Signals/Instructions to Control Movements	100,000 Employees	876,000 oral confirmations	1 minute	14,600 hours
- Remote Control Movements- Verbal Confirmation	100,000 Employees	876,000 RC determination	1 minute	14,600 hours
- Remote Control Determinations That Zone Is Not Jointly Occupied/Track Clear	6,000 Railroad Dispatchers	30,000 auth. movements	1 minute	500 hours
- Dispatcher Authorized Train Movements				
218.101- Operating Rule Re: Leaving Rolling & On-Track MOW Equipment in the Clear	722 railroads	36 amended op. rules	30 minutes	18 hours

218.103- Hand-Operated Switches – RR Operating Rule That Complies w /49 CFR 218.103 - Specification of Minimum Job Briefing Requirements -Employee Operating or Verifying Position of Hand-operated Switches: Job Briefings	722 railroads	36 modified operating rules	1 hour	36 hours
	722 railroads	5 modified op. rules	30 minutes	3 hours
	722 railroads	1,125,000 job briefings	1 minute	18,750 hours
218.105 - Additional Requirements for Hand Operated Main Track Switches – Job Briefing -Roadway Worker Report on Position of Switches to Roadway Worker in Charge (RWIC) or Designated Employee Conveying Information to RWIC - Dispatcher Acknowledgment of Switch Position and Employee Confirmation to Train Dispatcher	722 railroads	60,000 job briefings	1 minute	1,000 hours
	722 railroads	100,000 reports + 100,000 conveyances	1 minute + 1 minute	3,334 hours
	722 railroads	60,000 acknowledgments + 60,000 confirmations	30 seconds + 5 seconds	583 hours
218.109 - Hand Operated Fixed Derails: Job Briefings	722 railroads	562,500 job briefings	30 seconds	4,688 hours
<b><u>SUBPART G – New Requirements</u></b> - <b>218.125</b> – Adoption/Revision of RR Rules/Practices to comply with this Subpart	722 railroads	10 adopted/ revised rules	3 hours	30 hours
- <b>218.133</b> – Continuance of Operations Staffed without a Two-Person Crew Prior to Jan. 1, 2015 – Description by RR of One-Person Crew Operation	629 railroads  (FRA obtained this number by consulting with the ASLRRRA, AAR, and APTA.)	7 description	960 hours	6,720 hours
- <b>218.135</b> – Request for Special Approval of a Start-Up Method of Operation that Does not Meet Subpart G Requirements - Request for Special Approval of a Start-Up Method of Operation that Does not Meet Subpart - Comments Sent to FRA on Petitions for Special Approval - Commenter Certification that Copy of Comment has been Served on Each Petitioner	629 railroads	10 petitions	384 hours	3,840 hours
	629 railroads	5 petitions	192 hours	960 hours
	General Public/ RR Community/ Interested Parties	30 comments	22 hours	660 hours
	General Public/ RR Community/ Interested Parties	30 statement + 450 copies of comment	30 minutes + 2 minutes	30 hours

All estimates include the time for reviewing instructions, searching existing data sources, gathering or maintaining the needed data, and reviewing the information.

Pursuant to 44 U.S.C. 3506(c)(2)(B), FRA solicits comments concerning: whether these information collection requirements are necessary for the proper performance of the functions of FRA, including whether the information has practical utility; the accuracy of FRA's estimates of the burden of the information collection requirements; the quality, utility, and clarity of the information to be collected; and whether the burden of collection of information on those who are to respond, including through the use of automated collection techniques or other forms of information technology, may be minimized.

Organizations and individuals desiring to submit comments on the collection of information requirements or associated estimates detailed above should direct them to Mr. Robert Brogan, Information Collection Officer, Office of Railroad Safety, or Ms. Kimberly Toone, Records Management Officer, Office of Administration, Federal Railroad Administration, 1200 New Jersey Avenue, SE., 3rd Floor, Washington, DC 20590. Comments may also be submitted via email to Mr. Brogan or Ms. Toone at the following addresses: [Robert.Brogan@dot.gov](mailto:Robert.Brogan@dot.gov) or [Kim.Toone@dot.gov](mailto:Kim.Toone@dot.gov).

OMB is required to make a decision concerning the collection of information requirements contained in this proposed 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. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

FRA is not authorized to 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 any new information collection requirements resulting from this rulemaking action prior to the effective date of the 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, the 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, the agency consults with 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.

This NPRM has been analyzed in accordance with the principles and criteria contained in Executive Order 13132. This NPRM would not have a substantial effect on the States or their political subdivisions; it would not impose any compliance costs; and it would not affect the relationships between the Federal government and the States or their political subdivisions, or the distribution of power and responsibilities among the various levels of government. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply.

However, this NPRM 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. 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.

In summary, FRA has analyzed this final rule in accordance with the principles and criteria contained in Executive Order 13132. As explained above, FRA has determined that this NPRM has no federalism implications, other than the possible preemption of State laws under Federal railroad safety statutes, specifically 49 U.S.C. 20106. Accordingly, FRA has determined that preparation of a federalism summary impact statement for this NPRM is not required.

E. International Trade Impact Assessment

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

This NPRM is purely domestic in nature and is not expected to affect trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States.

F. Environmental Impact

FRA has evaluated this NPRM in accordance with the National Environmental Policy Act (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 that this NPRM is categorically excluded from detailed environmental review pursuant to section 4(c)(20) of FRA’s 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 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 categorical exclusion, the agency must also consider whether extraordinary circumstances are present that would warrant the preparation of an EA or EIS. Id. In accordance with section 4(c) and (e) of FRA's Procedures, the agency has further concluded that no extraordinary circumstances exist with respect to this regulation that might trigger the need for a more detailed environmental review (EA or EIS). The purpose of this rulemaking is to establish minimum requirements for the size of train crew staffs depending on the type of operation. FRA does not anticipate any environmental impacts from this requirement and finds that there are no extraordinary circumstances present in connection with this NPRM.

G. Unfunded Mandates Reform Act of 1995

Pursuant to 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."

This details the effect on State, local, and tribal governments and the private sector. For the year 2010, this monetary amount of \$100,000,000 has been adjusted to \$143,100,000 to account for inflation. This NPRM would not result in the expenditure of more than \$143,100,000 by the public sector in any one year, and thus preparation of such a statement is not required.

#### H. Energy Impact

Executive Order 13211 requires Federal agencies to prepare a Statement of Energy Effects for any “significant energy action.” 66 FR 28355, May 22, 2001. Under the Executive Order, a “significant energy action” is defined as any action by an agency (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 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 NPRM in accordance with Executive Order 13211. FRA has determined that this NPRM is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Consequently, FRA has determined that this NPRM is not a “significant energy action” within the meaning of Executive Order 13211.

#### I. Privacy Act

Anyone is able to search the electronic form of any written communications and

comments received into any of our dockets by the name of the individual submitting the comment (or signing the document, if submitted on behalf of an association, business, labor union, etc.). See <http://www.regulations.gov/#!privacyNotice> for the privacy notice of regulations.gov or interested parties may review DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000 (65 FR 19477). In accordance 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).

### **List of Subjects**

#### 49 CFR Part 218

Occupational safety and health, Penalties, Railroad employees, Railroad safety, Reporting and recordkeeping requirements.

### **The Proposed Rule**

For the reasons discussed in the preamble, FRA proposes to amend chapter II, subtitle B of title 49 of the Code of Federal Regulations as follows:

#### **PART 218—[AMENDED]**

1. The authority citation for part 218 is revised to read as follows:

**Authority:** 49 U.S.C. 20103, 20107; 28 U.S.C. 2461, note; and 49 CFR 1.89.

#### **Subpart A—General**

2. Section 218.5 is amended by adding definitions in alphabetical order for

“Associate Administrator” and “FTA”, to read as follows:

**§ 218.5 Definitions.**

\* \* \* \* \*

Associate Administrator means the Associate Administrator for Railroad Safety and Chief Safety Officer of the Federal Railroad Administration or that person’s delegate as designated in writing.

\* \* \* \* \*

FTA means the Federal Transit Administration.

\* \* \* \* \*

3. Add subpart G to part 218 to read as follows:

**Subpart G – Train Crew Staffing**

Sec.

- 218.121 Purpose and scope.
- 218.123 Definitions.
- 218.125 General crew staffing and roles and responsibilities of the second crewmember for freight and passenger trains.
- 218.127 General exceptions to two-person crew requirement.
- 218.129 Specific passenger train exceptions to two-person crew requirement.
- 218.131 Specific freight train exceptions to two-person crew requirement.
- 218.133 Continuance of freight operations staffed without a two-person train crew prior to January 1, 2015.
- 218.135 Special approval procedure.

**Subpart G – Train Crew Staffing**

**§ 218.121 Purpose and scope.**

(a) The purpose of this subpart is to ensure that each train is adequately staffed and has appropriate safeguards in place when using fewer than two person crews for safe train operations.

(b) This subpart prescribes minimum requirements for the size of different train crew staffs depending on the type of operation. The minimum crew staffing requirements reflect the safety risks posed to railroad employees and the general public. This subpart also prescribes minimum requirements for the appropriate roles and responsibilities of train crewmembers on a moving train, and promotes safe and effective teamwork. Each railroad may prescribe additional or more stringent requirements in its operating rules, timetables, timetable special instructions, and other instructions.

**§ 218.123 Definitions.**

Tourist, scenic, historic, or excursion operations that are not part of the general railroad system of transportation means a tourist, scenic, historic, or excursion operation conducted only on track used exclusively for that purpose (i.e., there is no freight, intercity passenger, or commuter passenger railroad operation on the track).

Trailing tons means the sum of the gross weights—expressed in tons—of the cars and the locomotives in a train that are not providing propelling power to the train.

Train means one or more locomotives coupled with or without cars, except during switching service.

Switching service means the classification of rail cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement.

**§ 218.125 General crew staffing and roles and responsibilities of the second**

**crewmember for freight and passenger trains.**

(a) General. Each railroad shall comply with the requirements of this subpart, and in doing so may adopt its own rules or practices. When any person as defined in § 218.9 (including, but not limited to, each railroad, railroad officer, supervisor, and employee) violates any requirement of a railroad rule or practice that ensures compliance with the requirements of this subpart, that person shall be considered to have violated the requirements of this subpart.

(b) Two-person crew staffing requirement. Except as provided for in this subpart, each train shall be assigned a minimum of two crewmembers.

(c) Hazardous material two crewmember minimum requirement. For the purposes of this paragraph, a tank car containing a “residue” of a hazardous material as defined in 49 CFR 171.8 is not considered a loaded car. None of the exceptions provided in §§ 218.127 through 218.135, which permit a train to be staffed with less than two crewmembers, is applicable when any train is transporting:

(1) One or more loaded freight cars containing materials poisonous by inhalation as defined in 49 CFR 171.8, including anhydrous ammonia (UN 1005) and ammonia solutions (UN 3318); or

(2) Twenty or more loaded freight cars or freight cars loaded with bulk packages as defined in 49 CFR 171.8 or intermodal portable tanks containing any combination of materials listed in paragraph (c)(1) of this section, or any Division 2.1 flammable gases, Class 3 flammable liquids, Class 1.1 or 1.2 explosives, or hazardous substances listed in 49 CFR 173.31(f)(2).

(d) Roles and responsibilities of the second crewmember when the train is moving. A train crewmember that is not operating the train may be located anywhere outside of the operating cab of the controlling locomotive when the train is moving as long as:

(1) For each train, the train crewmember is on the train, except when the train crewmember cannot perform the duties assigned without temporarily disembarking from the train;

(2) The train crewmember has the ability to directly communicate with the crewmember in the cab of the controlling locomotive;

(3) The train crewmember can continue to perform the duties assigned; and

(4) The location does not violate any Federal railroad safety law, regulation or order.

**§ 218.127 General exceptions to two-person crew requirement.**

Except as provided for in § 218.125(c), the following general exceptions apply to the two-person crew staffing and roles and responsibilities requirements in § 218.125. A passenger or freight train does not require a minimum of two crewmembers under the following conditions:

(a) Helper service. The train is performing helper service, thereby using a locomotive or group of locomotives to assist another train that has incurred mechanical failure or lacks the power to traverse difficult terrain. Helper service includes traveling to or from a location where assistance is provided;

(b) Tourist. The train is a tourist, scenic, historic, or excursion operation that is

not part of the general railroad system of transportation;

(c) Lite locomotive. A locomotive or a consist of locomotives not attached to any piece of equipment or attached only to a caboose. This exception excludes a diesel or electric multiple unit (DMU or EMU) operation;

(d) Work train. During work train operations where a non-revenue service train of 4,000 trailing tons or less is used for the administration and upkeep service of the railroad. The exception for work trains engaged in maintenance and repair activities on the railroad includes when the work train is traveling to or from a work site; or

(e) Remote control operations. The train is remotely controlled using the operator control unit assigned to the receiver on the controlling locomotive and the following conditions apply:

(1) The locomotive consist does not exceed 6,000 total working horsepower and is utilizing no more than 12 powering axles;

(2) The train length, excluding locomotives, does not exceed 3,000 feet;

(3) The train tonnage, excluding locomotives, does not exceed 4,000 tons;

(4) The train does not exceed a total of 50 conventional cars or platforms, in any combination;

(5) The train does not contain more than 20 multilevel cars, e.g., autorack cars, regardless of whether they are loaded or empty. Any continuous block of more than five multilevel cars must be placed at the rear of the train;

(6) The maximum authorized train speed is 15 miles per hour;

(7) Movements are restricted from operating on any grade greater than 1.0



percent that extends for more than half a mile; and

(8) The controlling railroad has developed air brake and train handling instructions governing these operations, and the remote control operator is required to comply with those instructions.

**§ 218.129 Specific passenger train exceptions to two-person crew requirement.**

The following passenger train operations do not require a minimum of two crewmembers:

(a) A passenger train operation in which cars are empty of passengers and are being moved for purposes other than to pick up or drop off passengers;

(b) A passenger train operation involving a single self-propelled car or married-pair unit, e.g., a diesel or electric multiple unit (DMU or EMU) operation, where the locomotive engineer has direct access to the passenger seating compartment and (for passenger railroads subject to 49 CFR part 239) the passenger railroad's emergency preparedness plan for this operation is approved under 49 CFR 239.201; or

(c) A rapid transit operation in an urban area, i.e., an urban rapid transit system or a light rail transit operator that is connected with the general railroad system of transportation under the following conditions:

(1) The operation is temporally separated from any conventional railroad operations;

(2) There is an FTA-approved and designated State Safety Oversight (SSO) Agency that is qualified to provide safety oversight; and

(3) The light rail operator has an FTA/SSO approved System Safety Plan in

accordance with 49 CFR part 659.

**§ 218.131 Specific freight train exceptions to two-person crew requirement.**

Except as provided for in § 218.125(c), the following specific freight train operations are exceptions from the two-person crew staffing and roles and responsibilities requirements in § 218.125.

(a) Small railroad exceptions. A freight train is operated on a railroad and by an employee of a railroad with less than 400,000 total employee work hours annually and the train is being operated under the following conditions:

(1) The maximum authorized speed of the train is limited to 25 miles per hour or less; and

(2)(i) The average grade of any segment of the track operated over is less than 1 percent over 3 continuous miles or 2 percent over 2 continuous miles; or

(ii) A second train crewmember, other than the locomotive engineer, is intermittently assisting the train's movements and has the ability to directly communicate with the crewmember in the cab of the controlling locomotive. The second train crewmember cannot meet the requirements in § 218.125 regarding the roles and responsibilities of the second crewmember because this person is frequently in transit and cannot continuously remain with the train.

(b) Mine load out, plant dumping, or similar operation. A freight train is being loaded or unloaded in an assembly line manner at an industry while the train moves at 10 miles per hour or less.

**Option 1**

**§ 218.133 Continuance of freight operations staffed without a two-person train crew prior to January 1, 2015.**

(a) Except as provided for in § 218.125(c), one-person freight train operations that were conducted prior to January 1, 2015, and that are not otherwise covered by the general or specific exceptions detailed in §§ 218.127 through 218.131 may continue to be conducted as long as the railroad conducting the one-person operation submits a description of the operation to the Associate Administrator for Railroad Safety and Chief Safety Officer, Federal Railroad Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590 no later than [DATE 90 DAYS AFTER EFFECTIVE DATE OF THE FINAL RULE]. The description of the operation shall, at a minimum, include the following:

(1) The location of the continuing operation with as much specificity as can be provided as to industries served, and territories, divisions, or subdivisions operated over. Documentation supporting the locations of prior operations will be favorably reviewed, although not required;

(2) The class of tracks operated over;

(3) The locations of any track where the average grade of any segment of the track operated over is 1 percent or more over 3 continuous miles or 2 percent or more over 2 continuous miles;

(4) The maximum authorized speed of the operation;

(5) The approximate average number of miles and hours a single person operates as a one-person train crew;

(6) Whether any limitations are placed on a person in a one-person train crew operation. Such limitations may include, but are not limited to, a maximum number of miles or hours during a single tour of duty;

(7) The maximum number of cars and tonnage, if any;

(8) Whether the one-person operation is permitted to haul hazardous materials of any quantity and type, other than those types expressly prohibited for one-person train crew operations in accordance with § 218.125(c);

(9) Information regarding other operations that travel on the same track as the one-person train operation or that travel on an adjacent track. Such information shall include, but is not limited to, the volume of traffic and the types of opposing moves (i.e., either passenger or freight trains hauling hazardous materials);

(10) Any information the railroad chooses to provide describing protections provided in lieu of a second train crewmember; and

(11) A safety analysis of the one-person train operation, including any information regarding the safety history of the operation.

(b) FRA intends to issue written notification of approval or disapproval within 90 days of receipt of the submission. FRA reserves the right to notify a railroad if a described operation that was in existence prior to January 1, 2015, is deemed unsuitable for continuance, or may continue with any additional conditions attached. FRA will consider the benefits and costs of actions it requests railroads to make as a condition for FRA approval. Unless FRA notifies a railroad that an operation is deemed unsuitable for continuance or may only continue with any additional conditions attached, the railroad

may continue the operation as described. If FRA notifies a railroad that an operation may not continue, FRA will provide the railroads the specific reason(s) and rationale for any such decision.

**§ 218.135 Special approval procedure.**

(a) General. The following procedures govern consideration and action upon requests for special approval of a start-up method of train operation that does not meet the requirements and conditions of §§ 218.125 through 218.133. Passenger railroads seeking to start-up a one-person train operation must have an approved passenger train emergency preparedness plan or apply for a waiver under part 239 of this chapter but may apply to FRA for special approval under this section in the same filing.

(b) Petitions for special approval of a train operation with less than two crewmembers. Each petition for special approval of a train operation with less than two crewmembers that does not meet the requirements and conditions of §§ 218.125 through 218.133 shall contain:

(1) The name, title, address, telephone number, and email address (if available) of the primary person to be contacted with regard to review of the petition;

(2) A detailed description of the train operation proposed, including a description of any technology that could potentially perform tasks typically performed by a second crewmember or that could prevent or significantly mitigate the consequences of catastrophic accidents;

(3) Appropriate data or analysis, or both, for FRA to consider in determining whether the train operation proposed will provide at least an appropriate level of safety to

a train operation with two crewmembers; and

(4) A statement affirming that the railroad has served a copy of the petition on the president of each labor organization that represents the railroad's employees subject to this part, if any, together with a list of the names and addresses of the persons served.

(c) Service. Each petition for special approval under paragraph (b) of this section shall be submitted to the Associate Administrator for Railroad Safety and Chief Safety Officer, Federal Railroad Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

(d) Federal Register notice. FRA will publish a notice in the Federal Register concerning each petition under paragraph (b) of this section.

(e) Comment. Not later than 30 days from the date of publication of the notice in the Federal Register concerning a petition under paragraph (b) of this section, any person may comment on the petition.

(1) A comment shall set forth specifically the basis upon which it is made, and contain a concise statement of the interest of the commenter in the proceeding.

(2) The comment shall be submitted to the Associate Administrator for Railroad Safety and Chief Safety Officer, Federal Railroad Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

(3) The commenter shall certify that a copy of the comment was served on each petitioner.

(f) Disposition of petitions. (1) If FRA finds that the petition is acceptable and justified, the petition will be granted, normally within 90 days of its receipt. FRA's

decision may attach additional conditions that a railroad must meet or exceed before implementing the operation as described. FRA will consider the benefits and costs of any actions it requests a petitioner to make as a condition for FRA approval, as well as the expected safety impacts. If FRA attaches conditions, it will provide the petitioner and the public, via its public website, with the specific reasons and rationale for those conditions.

(2) If the petition is neither granted nor denied within 90 days, the petitioner may file a request for FRA to decide the petition by no later than 30 days from the date FRA receives such a request. If this additional 30 days lapses without FRA issuing a decision, the railroad may implement the operation as described.

(3) If FRA finds that the petition does not comply with the requirements of this section and that the proposed train operation is not acceptable or justified, the petition will be denied. FRA will provide the petitioner and the public, via its public website, with the specific reasons and rationale for denying the petition.

(4) Following the approval of a petition, FRA may reopen consideration of the petition for cause.

(5) When FRA grants or denies a petition, or reopens consideration of the petition, written notice is sent to the petitioner and other interested parties.

## **Option 2**

### **§ 218.133 Continuance of freight operations staffed without a two-person train crew prior to January 1, 2015.**

(a) Except as provided for in § 218.125(c), one-person freight train operations that were conducted prior to January 1, 2015 and that are not otherwise covered by the

general or specific exceptions detailed in §§ 218.127 through 218.131 may continue to be conducted as long as the railroad conducting the one-person operation submits a description of the operation to the Associate Administrator for Railroad Safety and Chief Safety Officer, Federal Railroad Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590 no later than [DATE 90 DAYS AFTER EFFECTIVE DATE OF THE FINAL RULE]. The description of the operation shall, at a minimum, include the following:

(1) The location of the continuing operation with as much specificity as can be provided as to industries served, and territories, divisions, or subdivisions operated over.

(2) The class of tracks operated over;

(3) The locations of any track where the average grade of any segment of the track operated over is 1 percent or more over 3 continuous miles or 2 percent or more over 2 continuous miles;

(4) The maximum authorized speed of the operation;

(5) The approximate average number of miles and hours a single person operates as a one-person train crew;

(6) Whether any limitations are placed on a person in a one-person train crew operation. Such limitations may include, but are not limited to, a maximum number of miles or hours during a single tour of duty;

(7) The maximum number of cars and tonnage, if any;

(8) Whether the one-person operation is permitted to haul hazardous materials of any quantity and type, other than those types expressly prohibited for one-person train



crew operations in accordance with § 218.125(c);

(9) Information regarding other operations that utilize the same track as the one-person train operation or that travel on an adjacent track. Such information shall include, but is not limited to, the volume of traffic and the types of opposing moves (i.e., either passenger or freight trains hauling hazardous materials);

(10) Any information the railroad chooses to provide describing protections provided in lieu of a second train crewmember; and

(11) A safety analysis of the one-person train operation shall be conducted and made available to FRA upon request during an investigation described in paragraph (b) of this section, including any information regarding the safety history of the operation.

(b) A railroad may continue any one-person train operations that were conducted prior to January 1, 2015, upon filing the description of each operation with FRA. FRA will use the description as part of an evaluation to determine whether the railroad is providing an appropriate level of safety. Depending on a variety of factors, including FRA's familiarity with the railroad's one-person operation and the risk factors associated with the operation, FRA may initiate an investigation to aid in the determination. If FRA determines that an operation is not providing an appropriate level of safety, FRA will notify the railroad that the operation shall not continue or shall only continue under certain conditions. FRA will consider the benefits and costs of actions it requests railroads to make as a condition for the operation to continue. If FRA notifies a railroad that an operation shall not continue, or shall continue only if conditions are met, FRA will provide the railroad and the public, via its public website, the specific reason(s) and

rationale for the decision.

(c) A railroad shall adhere to the restrictions, limitations, and procedures it identifies in its submission to FRA as well as any condition imposed by FRA.

**§ 218.135 Special approval procedure.**

(a) General. The following procedures govern a start-up method of train operation that does not meet the requirements and conditions of §§ 218.125 through 218.133. Passenger railroads seeking to start-up a one-person train operation must have an approved passenger train emergency preparedness plan or apply for a waiver under part 239 of this chapter but may apply to FRA for special approval under this section in the same filing.

(b) Description of a train operation with less than two crewmembers. A railroad initiating a train operation with less than two crewmembers that does not meet the requirements and conditions of §§ 218.125 through 218.133 shall provide FRA with the name, title, address, telephone number, and email address (if available) of the primary person to be contacted with regard to the operation. The railroad shall submit a detailed description of each train operation with less than two crewmembers prior to beginning such service, which covers:

(1) Any technology that could potentially perform tasks typically performed by a second crewmember or that could prevent or significantly mitigate the consequences of catastrophic accidents;

(2) The class of tracks operated over;

(3) The locations of any track where the average grade of any segment of the

track operated over is 1 percent or more over 3 continuous miles or 2 percent or more over 2 continuous miles;

(4) The maximum authorized speed of the operation;

(5) The approximate average number of miles and hours a single person operates as a one-person train crew;

(6) Whether any limitations are placed on a person in a one-person train crew operation. Such limitations may include, but are not limited to, a maximum number of miles or hours during a single tour of duty;

(7) The maximum number of cars and tonnage, if any;

(8) Whether the one-person operation is permitted to haul hazardous materials of any quantity and type, other than those types expressly prohibited for one-person train crew operations in accordance with § 218.125(c);

(9) Information regarding other operations that utilize the same track as the one-person train operation or that travel on an adjacent track. Such information shall include, but is not limited to, the volume of traffic and the types of opposing moves (i.e., either passenger or freight trains hauling hazardous materials);

(10) Any information the railroad chooses to provide describing protections provided in lieu of a second train crewmember; and

(11) A statement signed by the railroad officer in charge of operations attesting that a safety analysis of the start-up operation with less than two crewmembers has been conducted and that the operation provides an appropriate level of safety. The safety analysis shall be made available to FRA upon request.

(c) Service. This information shall be submitted to the Associate Administrator for Railroad Safety and Chief Safety Officer, Federal Railroad Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

(d) Public notice. FRA will post the information identified in paragraph (b) of this section on its public website to permit interested parties an opportunity to provide additional information or comment on the operation identified by the railroad.

(e) Review Process. A railroad may initiate a start-up train operation with less than two crewmembers after the railroad submits the information identified in this section to FRA unless FRA informs the railroad that the information is incomplete. Depending on a variety of factors, including FRA's familiarity with the railroad's operation and the risk factors associated with the operation, FRA may initiate an investigation to aid in the determination. If FRA determines that an operation is not providing an appropriate level of safety, FRA will notify the railroad that the operation shall not continue or shall only continue under certain conditions. FRA will consider the benefits and costs of conditions it requires railroads to meet to continue a start-up train operation with less than two crewmembers. If FRA notifies a railroad that an operation shall not continue, or shall continue only if conditions are met, FRA will provide the railroad and the public, via its public website, the specific reason(s) and rationale for the decision.

(f) Compliance. A railroad shall adhere to the restrictions, limitations, and procedures it identifies in its submission to FRA as well as any condition imposed by FRA.

Issued in Washington, DC, on March 8, 2016, under the authority set forth in 49 CFR  
1.89(b).

**Sarah Feinberg,**  
*Administrator.*