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DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

49 CFR Part 218

[Docket No. FRA-2021-0032, Notice No. 1]

RIN 2130-AC88

Train Crew Size Safety Requirements

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

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: FRA proposes regulations establishing safe minimum requirements for the size of train crews 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 do not pose significant safety risks to railroad employees, the public, or the environment. This proposed rule would also establish minimum requirements for the location of crewmembers on a moving train and promote safe and effective teamwork. FRA also proposes a special approval procedure to allow railroads to petition FRA to continue legacy operations with one-person train crews and allow any railroad to petition FRA for approval to initiate a new train operation with fewer than two crewmembers.

DATES: Comments on the proposed rule must be received by [**INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**]. FRA will consider comments received after that date to the extent practicable.

ADDRESSES: *Comments*: Comments related to Docket No. FRA-2021-0032 may be submitted by going to *https://www.regulations.gov* and following the online instructions for submitting comments.

Instructions: All submissions must include the agency name, docket number (FRA-2021-0032), and Regulatory Identification Number (RIN) for this rulemaking (2130-AC88). All comments received will be posted without change to https://www.regulations.gov; this includes any personal information. Please see the Privacy Act heading in the **SUPPLEMENTARY INFORMATION** section of this document for Privacy Act information related to any submitted comments or materials.

Docket: For access to the docket to read background documents or comments received, go to https://www.regulations.gov and follow the online instructions for accessing the docket.

FOR FURTHER INFORMATION CONTACT: Kevin Lewis, Operating Crew Certification Specialist, U.S. Department of Transportation, Federal Railroad Administration, telephone: 918-557-0651, email: *kevin.lewis@dot.gov*; or Alan H. Nagler, Senior Attorney, U.S. Department of Transportation, Federal Railroad Administration, telephone: 202-493-6038, email: *alan.nagler@dot.gov*.

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I. Executive Summary

Purpose of the Regulatory Action

For the past five years, a period in which railroad operations have produced consistent safety statistics, railroads (including freight, passenger, and tourist operations) have typically utilized crews of at least two persons. During this time, railroads have implemented positive train control (PTC) and other technologies and are expected to implement upgrades to these technologies and otherwise look to introduce operational efficiencies. FRA intends this rule to ensure that trains are adequately staffed for their intended operation and railroads have appropriate safeguards in place for safe train operations, whenever using a crew of fewer than two persons. In the event a railroad desires to transition a train operation to an operation with fewer than two crewmembers, as proposed, this rule would require the railroad to consider and address the safety risks of doing so by conducting a risk assessment of the proposed operation. Research identified the cognitive and collaborative demands placed on crewmembers and indicates that an increase in physical tasks and cognitive demands for a one-person crewmember could potentially lead to task overload or a loss of situational awareness that could cause an accident. The proposed risk assessment requirement would follow accepted hazard analysis processes and provide for the mitigation of identified hazards to acceptable levels.

Without this proposed rule, FRA has a limited ability to address the totality of potential safety issues related to the reduction of crew staffing levels. Currently, FRA can exercise its authority in discrete instances through the agency's emergency order authority (potentially after a serious accident) or in review of a passenger operation's emergency preparedness plan under 49 CFR part 239. Also, none of the other recent regulatory initiatives FRA has issued or is in the process of developing focus on the specific hazards and risks associated with reducing the number of train crewmembers to fewer than two crewmembers, nor do they require railroads to mitigate any such hazards and risks.

This proposed rule is necessary for FRA to proactively protect railroad employees, the public, and the environment. By requiring railroads to petition FRA for approval of existing (legacy) or new one-person crewmember operations, this proposed rule would allow FRA to closely examine the safety of legacy operations in accordance with established, minimum safety requirements, and prohibit the initiation of one-person crewmember operations that would not be consistent with railroad safety. FRA proposes to require this petition to include consideration of the impact that operating with fewer than two crewmembers may have on mitigating the consequences of rail accidents and minimizing blocked at-grade highway-rail crossings.

Further, if a railroad petitions FRA to continue or initiate a train operation with fewer than two crewmembers, this rulemaking proposes a public comment period so that stakeholders, such as the railroad's employees, or businesses and communities adjacent to or served by the railroad, can provide relevant safety information or data.

This proposed rule is also necessary to prevent the multitude of State laws regulating crew size from creating a patchwork of rules governing train operations across the country. Despite the fact that provisions of the Federal railroad safety statutes mandate that laws, regulations, and orders "related to railroad safety" be nationally

uniform, FRA is aware that some States have laws in place regulating crew size in a variety of ways. For example, California requires a minimum of two crew members for certain trains,[1] Washington requires a minimum of two crew members for certain trains and switching assignments,[2] Nevada requires a minimum of two crew members for certain trains or locomotives of certain railroads,[3] while Arizona has a "full crew" requirement for certain trains (requiring not only an engineer and conductor but crewmembers such as firemen, brakemen, and flagmen on certain trains),[4] and Massachusetts imposes other restrictions (providing the Department of Public Utilities can order changes to the crew size of any train).[5] Without this rule, railroads could be subjected to a different crew staffing law in every State in which they operate. Such a patchwork of State laws would likely result in significant cost and operational inefficiencies, and even potential safety concerns from a lack of a uniform standard. In this regard, there would be no assurance that State laws would be based on an analysis or determination concerning such impacts on safety.

Summary of Major Provisions

FRA is proposing regulations to ensure that trains are appropriately staffed for their intended operation and railroads have sufficient safeguards in place for safe train

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[1] Cal. Lab. Code sec. 6903, which requires at least a two-person crew for operation of a train or light engine used in connection with the movement of freight, not including hostler service or utility employees.

[2] Wash. Rev. Code Ann. sec. 81.40.015, which requires at least two crewmembers for all freight and passenger trains and switching assignments, not including Class III railroad carriers operating on their roads while at a speed of twenty-five miles per hour or less.

[3] N.R.S. sec. 705.415, which requires a train or locomotive crew of not less than two persons on any Class I freight railroad, Class I railroad or Class II railroad for transporting freight with the exception of a train or locomotive engaged in helper or hostling services.

[4] Ariz..Rev. Stat. Ann. sec. 40-881, which requires a passenger, mail or express train composed of less than six cars train to carry a crew consisting of not less than one engineer, one fireman, one conductor and one flagman, with an exception for gasoline motor cars; and, for those same types of trains that are longer, the crew must add a brakeman, but may drop the flagman when such train is operated outside yard limits on branch lines including the use of main lines where necessary to reach initial or final terminals of branch lines.

[5] Mass. Gen. Laws Ann. Ch. 160, sec. 185, which provides discretion to its Department of Public Utilities to order changes as it deems necessary whenever the department is of opinion, after a hearing, that the number of men forming a train crew of any train is not sufficient to operate said train for the safety of the public and the employees of the railroad.

operations, whenever using a crew of fewer than two persons. With certain exceptions, FRA proposes to require that railroads staff every train operation with a minimum of two crewmembers (including a locomotive engineer and an additional crewmember). The proposed rule prescribes minimum requirements for the location of crewmembers on a moving train, requirements to ensure any crewmember not operating the train and outside of the operating cab of the controlling locomotive can directly communicate with the locomotive engineer, and special approval procedures for railroads to petition FRA to continue certain legacy operations with one-person train crews and to initiate new train operations with fewer than two crewmembers.

The NPRM is based on the premise that the locomotive engineer always located in the cab of the controlling locomotive when the train is moving unless the controlling locomotive is being operated remotely in accordance with 49 CFR 229.15. In most instances, there will only be one additional crewmember—usually a conductor. As proposed, however, the NPRM would not prohibit a railroad from having more than two crewmembers or from having additional or more stringent requirements governing the proper location of any crewmembers other than the locomotive engineer. Railroads also have the flexibility to adopt their own rules or practices based on Federal requirements and instruct their employees to comply with such rules or practices.

Although the NPRM includes several proposed exceptions to the minimum two crewmember requirement, the rule would prohibit certain train operations from operating with fewer than two crewmembers. Specifically, proposed § 218.123(c) prohibits the operation, without at least a two-person crew, of trains containing certain quantities and types of hazardous materials that have been determined to pose the highest risk in transportation from both a safety and security perspective (e.g., trains transporting 20 or more car loads or intermodal portable tank loads of certain hazardous materials or one or more car loads of hazardous materials designated as rail-security sensitive materials

(RSSM) as defined by the Department of Homeland Security). FRA proposes a total of ten exceptions to the minimum two crewmember requirement. In § 218.125, FRA proposes two general exceptions to the minimum two crewmember requirement. The first proposed exception includes trains operating in helper service (i.e., a train that is assisting another train that has incurred a mechanical failure or lacks the power to traverse difficult terrain) because, as explained in greater detail in the section-by-section analysis, railroads commonly use one-person crews safely in helper service and helper service operations are generally not complex. The second proposed exception includes trains consisting of a locomotive or a consist of locomotives (excluding diesel or electric multiple units (DMUs or EMUs)) not attached to any piece of equipment or attached only to a caboose because, as explained in greater detail in the section-by-section analysis, these types of movements are typically made so that the locomotives can be better utilized and such movements pose less risk to railroad employees and the general public.

As applied to passenger and tourist train operations, the NPRM (§ 218.127) proposes four exceptions to the minimum two crewmember requirement. First, FRA proposes to except from the minimum two crewmember requirement tourist, scenic, historic, or excursion operations that are not part of the general railroad system of transportation. Second, FRA proposes to except from the minimum two crewmember requirement passenger or tourist operations in which cars, empty of passengers, are being moved and passengers do not board the train's cars until the crew conducts a safety briefing on the safe operation and use of the cars' exterior side doors, consistent with the current door safety briefing requirement. Of course, there may be reasons to employ a two-person train crew if switches need to be thrown or other safety-related tasks suggest a second crewmember is warranted, notwithstanding this exception for movement of empty cars. The third exception applies to certain passenger or tourist operations where the locomotive engineer has direct access to the passenger seating compartment. Finally,

FRA proposes to except certain rapid transit operations from the minimum two crewmember requirement.

As applied to freight operations, FRA is also proposing in § 218.129 four exceptions to the minimum two crewmember requirement. FRA is proposing exceptions for certain unit freight train loading and unloading operations, certain small railroad operations, and work train and remote-control operations that meet certain requirements. More detail on each of these proposed exceptions is found in the relevant section-by-section analysis below.

Proposed § 218.131 would allow legacy, one-person train operations to continue after the effective date of a final train crew size safety requirements rule until FRA can review the safety of the operation. Moreover, this proposed rule provides a mechanism for the operation to continue after FRA conducts its review.

FRA proposes to define a legacy operation as one that a railroad established at least two years before the effective date of a final rule establishing train crew size safety requirements. The proposed rule would prohibit a railroad from continuing a legacy, one-person train operation beyond 90 days after the effective date of a final rule if the railroad fails to file a special approval petition containing a description of the operation. As proposed, a railroad petition to continue a legacy, one-person operation must include evidence that the railroad has implemented certain rules and practices designed to ensure the safety of the one-person operation.

Proposed § 218.133 would allow a railroad to petition FRA to initiate a new train operation staffed with fewer than two crewmembers that is not otherwise prohibited or permitted by the other requirements of subpart G. In addition to much of the information FRA proposes to require to support a petition to continue a legacy operation, a special approval petition to initiate a new operation with fewer than two persons must contain a risk assessment of the proposed operation that follows accepted hazard analysis processes

and provides for mitigation of identified hazards to acceptable levels. In the context of this rulemaking, a risk assessment is the process of determining, either quantitatively or qualitatively, the level of risk associated with a proposed train operation staffed with fewer than two crewmembers, including mitigating the risks to an acceptable level. As discussed in more detail in section III.I below, when the likelihood of an event whose probability of occurrence is so small, consequence(s) so slight, or benefit(s) so great, taking the risk or subjecting others to the risk is deemed acceptable. Generally, an acceptable level of risk is achieved when it is determined that further risk reduction measures will not result in an additional, significant reduction of risk in excess of the cost of such measures. For example, there is a risk that a locomotive engineer will operate a train past a red signal. A resulting hazard is that the train will collide with another train on the track past the signal. The probability that this unsafe event will occur is based on an analysis of the causal factors that could lead the engineer to operate the train past the red signal. The likelihood of an accident resulting is analyzed based on the probability that another train is occupying the track past the signal. Mitigation measures (e.g., a train control system or certain operating rules) may not be able to completely eliminate the risk of the hazard, but the risk of the hazard (i.e., a collision) occurring may be reduced to a level where additional mitigations would not be effective and the likelihood of the unsafe event occurring would be so small, further mitigations would not be warranted.

The minimum process and content requirements for a railroad's risk assessment are proposed in § 218.135. Section 218.135 would also allow a railroad to use alternative methodologies or procedures, or both, to conduct a risk assessment if the Associate Administrator finds they will provide an accurate assessment of the risk associated with the proposed operation.

In proposed § 218.137 a railroad would be able to petition FRA for special approval for both one-person, legacy train operations and the initiation of a new operation

with fewer than two train crewmembers. FRA estimates the time burden for a railroad to prepare a petition will be 40 hours per petition for legacy train operations and 48 hours per petition for new operations. The proposed special approval procedure is expected to take 120 days once a railroad submits a petition for special approval. For example, the proposed special approval procedure would require that FRA publish a notice in the **Federal Register** soliciting public comment on each petition. All documents would be filed in a public docket and internet accessible. The proposed special approval procedure envisions that FRA may reopen consideration of the petition for cause stated. FRA proposes that when it decides a petition, or reopens consideration of a petition, it will send written notice of the decision to the petitioner and the decision will be published in the docket. Further, FRA proposes that a railroad making a material modification to an operation previously approved by FRA must file a description of the modification, and either a new or updated risk assessment, at least 60 days before proposing to implement any such modification. The proposed requirement to seek special approval is not expected to delay action on any operation because each railroad would need an equivalent timeframe to plan for the process of reducing crew size in advance of implementation.

Finally, FRA proposes an annual requirement for railroads that receive special approval to continue a legacy operation or initiate a new operation with fewer than two train crewmembers to conduct a formal review and analysis of those operations. FRA proposes an annual requirement to ensure that each railroad is regularly reviewing the safety of its operation and the accuracy of its risk assessment, and to provide FRA with enough data to identify any safety trends in the approved operations. Further, an annual

requirement aligns with the general administration of FRA's safety program as well as FRA's statutory requirements.[6]

Costs and Benefits

FRA analyzed the economic impact of this proposed rule. FRA estimated the costs associated with special approvals, risk assessments, annual railroad responsibilities after receipt of special approval, and Government administration.

The primary benefit of this rule is to ensure any railroad, seeking to operate a train with fewer than two crewmembers identifies, evaluates, and addresses, in a comprehensive and standardized manner, safety concerns that may arise from such operation. A second crewmember performs important safety functions that could be lost when reducing crew size below two.

FRA proposes that railroads seeking to operate trains with fewer than two crewmembers will be required to submit a petition to FRA to approve such an operation. The proposed petition process would require the submission of information demonstrating that the operation will be operated consistent with railroad safety. Additionally, the proposed safety requirements in this NPRM would allow the rail industry to maintain its strong safety record without proposing any restrictions that would directly impact its competitiveness compared with other modes of transportation.

This rule thus further ensures railroads operate in a safe manner by requiring them to properly assess and mitigate risks associated with fewer crewmembers, before initiation of such an operation, which they currently are not required to do. FRA seeks comment from all stakeholders, including any States with laws on train crew size.

FRA estimates the 10-year costs of the proposed rule to be $2.0 million, discounted at 7 percent. The annualized costs would be $0.3 million discounted at 7

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[6] *See e.g.*, 49 U.S.C. 103(j) and (k) (requiring the FRA Administrator to develop long-range national rail plans, and performance goals and reports for those plans that are typically updated annually).

percent. The following table shows the total costs of this proposed rule, over the 10-year analysis period. FRA qualitatively discusses the benefits but does not have sufficient data to monetize those benefits.

Total 10-Year Discounted Costs (2020 Dollars)[7]

Category	Total Cost, 7 Percent ($)	Total Cost, 3 Percent ($)	Annualized Cost, 7 Percent ($)	Annualized Cost, 3 Percent ($)
Special Approval (Legacy Operations)	41,486	41,486	5,907	4,863
Special Approval (New Operations)	318,665	400,442	45,371	46,944
Risk Assessment (Initial and Revisions)	555,124	696,616	79,037	81,665
Risk Assessment - Material Modifications	159,353	197,690	22,688	23,175
Railroad Annual Oversight Responsibilities	127,374	161,450	18,135	18,927
Government Administrative Cost	806,837	1,006,977	114,875	118,048
Total Costs	**2,008,840**	**2,504,662**	**286,014**	**293,623**

II. Legal Authority

FRA is proposing regulations concerning train crew size safety requirements 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."[8] The Secretary delegated this authority to the Federal Railroad Administrator.[9]

III. Background

A. A Brief History of Train Crew Staffing

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[7] Numbers in this table and subsequent tables may not sum due to rounding. As discussed further in section VI.I. of the Regulatory Impact Analysis (RIA), quantified costs do not include costs that could be incurred in order to mitigate risks associated with a reduction in the number of crewmembers.
[8] 49 U.S.C. 20103.
[9] 49 CFR 1.89(a).

1. General History

Historically, technology has enabled a gradual reduction in the number of train crewmembers from about five in the 1960s to about two by the end of the 1990s. Four major technological breakthroughs led to train crew staffing reductions. First, the phase-out of steam locomotives allowed locomotives to be operated without the crewmember known as the fireman, dedicated to keeping the engine fed with coal. Second, 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, allowing the conductor to move from the caboose to the lead locomotive and leading to the eventual removal of a crewmember known as a brakeman. Third, 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. Fourth, the development of improved train control devices, such as Cab Signal System, Automatic Train Stop, and Automatic Train Control, helped automate safer operations in case of human error. Further, over the last 25 years, remotely controlled locomotive operations utilizing only a one-person crew for switching service have become commonplace.

By statute, the Secretary of DOT is required to "prescribe regulations and issue orders to establish a program requiring the licensing or certification . . . of any operator of a locomotive."[10] A person[11] who operates a locomotive or train is a locomotive engineer. FRA fulfilled that statutory requirement in 1991 by issuing a regulation requiring each railroad to file a locomotive engineer certification program with FRA.[12] Each railroad's program must specify how the railroad plans to make the determinations necessary to certify each of its locomotive engineers, as well as ensure that the certified locomotive

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[10] 49 U.S.C. 20135.
[11] Although current FRA regulations do not explicitly require the presence of a human operator, FRA's regulations were developed and drafted based on a general assumption that a train would be operated by a person albeit with assistance from technology. Automated operations are discussed later in this NPRM.
[12] 56 FR 28254 (June 19, 1991), 49 CFR part 240.

engineers of other railroads are qualified to safely operate on the controlling railroad's track.[13] A locomotive engineer's main task is to operate the train safely. Other important tasks central to operation include: ensuring that the locomotive mechanical requirements are met; coordinating with the conductor about operational details; and, under the conductor's supervision, interpreting train orders, signals, and operating rules.

FRA also has conductor certification requirements[14] that were statutorily mandated.[15] FRA defines a conductor as the crewmember in charge of a train or yard crew,[16] and the conductor's job requires supervising train operations so they are safe and efficient. The conductor's responsibilities include: managing the train consist; coordinating with the locomotive engineer for safe and efficient en route operation; interacting with dispatchers, roadway workers, and others outside the cab; and dealing with exceptional situations (e.g., mechanical problems).[17] In addition, as locomotive and train technologies have become more complex in recent years, a conductor (or second crewmember) can assist a locomotive engineer by responding to technology prompts or conveying information displayed that will allow the engineer to focus on the train's controls and movement. The purpose of the conductor certification regulation is to ensure that only those persons meeting minimum Federal safety standards serve as conductors. When FRA published the conductor certification final rule, the agency made clear that the rule should not be read as FRA's endorsement of any particular crew

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[13] 49 CFR part 240, subpart B—Component Elements of the Certification Process, and § 240.229 (requiring certain action on the part of a railroad controlling the conduct of joint operations with another railroad). Additional guidance was provided in an interpretation published August 29, 2008. 73 FR 50883.
[14] 49 CFR part 242, "Qualification and Certification of Conductors."
[15] 49 U.S.C. 20163, "Certification of train conductors."
[16] 49 CFR 242.7 (defining "conductor").
[17] Rosenhand, Hadar, Emilie Roth, and Jordan Multer, Cognitive and Collaborative Demands of Freight Conductor Activities: Results and Implications of a Cognitive Task Analysis, FRA (July 2012).

consist arrangement.[18] For a one-person train crew, FRA requires that the crewmember be certified as both a locomotive engineer and a conductor.[19]

2. Indiana Rail Road's One-Person Train Crew Operation

Indiana Rail Road (INRD), a Class II, 250-mile regional railroad that operates in southern Indiana and Illinois, was a trailblazer in initiating one-person crew operations in the United States. During a July 15, 2016, FRA public hearing on FRA's 2016 train crew staffing NPRM, an INRD manager testified about how INRD established its one-person operation.[20] For instance, INRD officials observed operations overseas before implementing one-person operations on INRD.[21]

Without mentioning whether INRD conducted a risk assessment or similar safety analysis, INRD imposed on itself more stringent requirements than what are Federally required. INRD determined that all employees would be considered train operators, dual-certified as both locomotive engineers and conductors, and represented by the Brotherhood of Locomotive Engineers and Trainmen (BLET).[22] INRD's manager testified that: these one-person train operators are not working 12 hours on duty as permitted by the hours of service laws, but instead are on duty 9 to 10 hours; three-quarters of these train operators are also working assigned jobs, meaning they have set, five-day work schedules; and, the majority of these train operators are operating unit trains, which are entire trains hauling a single commodity, which for INRD generally means entire trains hauling "grain, coal, rock, coke, things like that."[23] Although FRA has found that the limitations INRD has imposed on its one-person operations have

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[18] 76 FR 69802, 69825 (Nov. 9, 2011).
[19] 49 CFR 240.308(c) and 242.213(d).
[20] A transcript of the public hearing is available in the docket to the 2016 NPRM at https://www.regulations.gov/document?D=FRA-2014-0033-1559 ("Hearing Transcript"). Bob Babcock, INRD Senior Vice President of Operations and Business Development, testified beginning on page 77 of the Hearing Transcript.
[21] Hearing Transcript at 80.
[22] Hearing Transcript at 80-81.
[23] Hearing Transcript at 81.

helped establish its positive safety record,[24] there are no Federal requirements prohibiting INRD from changing its self-imposed standards for the safety of one-person operations.

INRD's manager also explained how he invited FRA to visit and discuss INRD's one-person operations with INRD's operating rules personnel thereby soliciting FRA's feedback on what was "missing or . . . should [be] change[d]."[25] INRD's manager stated the "[m]ain reason [INRD] did that [was] there [are] obviously things that [INRD] probably missed or [INRD] hadn't thought of because there's a lot going on" and FRA could be helpful because it "deal[s] with a lot of railroads, a lot of other situations."[26] FRA's feedback led INRD to adopt or enhance procedures that protect the one-person crew in an emergency, establish more frequent communications between the one-person crew and the dispatcher, and implement standard procedures for protecting grade crossings, releasing automatic interlockings, and addressing other circumstances typically handled by a conductor.

In the INRD manager's remarks at the 2016 public hearing, he stated that the number of one-person crew starts on INRD has lessened in the last couple of years

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[24] In the 2016 NPRM, FRA explained that it would expect to approve the continuation of a freight operation if it met certain characteristics that were directly taken from a document INRD submitted to the Office of Information and Regulatory Affairs (OIRA) during the Executive Order 12866 review in which INRD explained the characteristics of its operation. *See* 81 FR 13951 and https://www.reginfo.gov/public/do/viewEO12866Meeting?viewRule=true&rin=2130-AC48&meetingId=834&acronym=2130-DOT/FRA (handout). Those characteristics are: 70 percent or more of the railroad's carload traffic is non-hazardous materials; the railroad has adopted crew staffing rules and practices to ensure compliance with all Federal rail safety laws, regulations, and orders; the maximum authorized track speed for the operation is 40 mph; the one-person train crewmembers have set daytime schedules with little fluctuation; the one-person train crewmembers average on-duty time is less than 9.5 hours per shift; the operation is structured so that the one-person crewmember would not have to leave the locomotive cab except in case of emergency; 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; 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; 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; 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 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.

[25] Hearing Transcript at 109.

[26] Hearing Transcript at 110.

because "the nature of [INRD's] business has changed from percentage of unit trains, which lend themselves to the one-man crews . . . [to] more route switcher local work."[27] FRA understands this statement to mean that INRD reduced the number of one-person crew starts because route switcher local work involves frequent switching, which may pose increased safety hazards if the one crewmember has to repeatedly mount and dismount the locomotive, throw switches, and couple and uncouple cars. However, when the nature of INRD's business changed, the railroad was not required to reduce the number of one-person crew starts, nor conduct any risk assessment or safety analysis, to ensure it maintained its positive safety record.

B. Summary of Prior Crew Staffing Rulemaking and Court Order

On March 15, 2016, FRA issued an NPRM proposing regulations concerning train crew staffing.[28] The 2016 NPRM arose out of two rail accidents in 2013. One accident was illustrative of how a second train crewmember might have prevented grave harm (Lac-Mégantic, Quebec) and the other showed how multiple train crewmembers can help prevent harm post-accident, as well as how an expert crewmember team can support each other during life-threatening conditions (Casselton, North Dakota).[29]

On July 5-6, 2013, a catastrophic accident occurred in Lac-Mégantic, Quebec, Canada involving a one-person crew that failed to properly secure a train before leaving it unattended on mainline track where it 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.[30] There were multiple explosions

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[27] Hearing Transcript at 81; *see also id.* at 125.
[28] 81 FR 13918. The 2016 NPRM, and all comments submitted in response to that NPRM, is available for review in Docket Number FRA-2014-0033 on www.regulations.gov.
[29] The accidents, which are described in this summary, are more extensively described in the 2016 NPRM. *See* 81 FR 13921-13924 (Mar. 15, 2016).
[30] 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.

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. In the aftermath of the 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; however, the railroad involved in the accident 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.[31] 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. TSB of Canada's report also highlighted how "risk assessments are particularly crucial when a company makes a change to its operations, since this is when new risks may emerge" and that the railroad's risk assessment in this instance "did not thoroughly identify and manage the risks to ensure safe operations."[32]

FRA's initial response to the Lac-Mégantic accident was to issue Emergency Order 28 on August 2, 2013, which contained the preliminarily known details of the events that led to the accident and ordered each railroad to institute and carry out specific measures with respect to securement of unattended vehicles and trains transporting

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[31] Letter from Joseph C. Szabo, FRA Administrator, to Mr. Edward Burkhardt, CEO of MMA (Aug. 21, 2013), placed in the docket.
[32] TSB of Canada Railway Investigation R13D0054 at 123.

certain types of hazardous material on mainline track and mainline sidings outside of a yard or terminal.[33] On August 29, 2013, FRA followed the issuance of the emergency order by hosting an emergency meeting of its Federal Advisory Committee known as the Railroad Safety Advisory Committee (RSAC).[34] At the time of the meeting, RSAC was composed of 54 voting representatives from 32 member organizations, representing various rail industry perspectives.[35] RSAC was established to provide advice and recommendations to FRA on railroad safety matters and, in the announcement for the meeting, FRA requested "that both freight and passenger railroads be prepared to discuss Transport Canada's directive requiring that two-person crews operate trains carrying hazardous materials on main track."[36] On August 29, 2013, RSAC accepted a task (No. 13–05) entitled ''Appropriate Train Crew Size'' and formed a Working Group. The task statement noted that, in light of the Lac-Mégantic accident, "FRA believes it is appropriate to review whether train crew staffing practices affect railroad safety."[37] In the 2016 NPRM, FRA summarized discussions of RSAC's Working Group and explained that, although no consensus was reached on any recommendations,[38] the 2016 proposed rule largely reflected concerns FRA identified during the Working Group meetings.[39]

Before the RSAC Working Group concluded its meetings on March 31, 2014,[40] ana accident occurred at Casselton, North Dakota on December 30, 2013, that FRA considered illustrative of how having multiple train crewmembers can improve safety for

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[33] 78 FR 48218 (Aug. 7, 2013) (noting the emergency order was issued five days before it was published).
[34] 78 FR 48931 (Aug. 12, 2013) (announcing the RSAC emergency meeting).
[35] *Id*. and *see also* 81 FR 13935-36 (providing an overview of RSAC).
[36] 78 FR 48931.
[37] 81 FR 13936.
[38] 81 FR 13936-39.
[39] 81 FR 13941-42.
[40] 81 FR 13938.

the general public and the crewmembers themselves.[41] In this incident, a "grain train" derailed on an adjacent track about two minutes before a "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 it. The collision derailed the key train's two leading locomotives, as well as the first 21 trailing cars behind the locomotives, causing a release of an estimated 474,936 gallons of crude oil 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. Meanwhile, the train crewmembers on both trains performed admirably.

During the 2013 Casselton incident, the grain train's locomotive engineer and conductor crewmembers potentially prevented the environmental and property damages from being much worse, in addition to potentially shortening the evacuation period, by calling a trainmaster for permission and coordinating with emergency responders to twice cut undamaged tank cars away from the burning derailed cars.[42] Although an exact timeline was not established in investigation reports, the National Transportation Safety

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[41] FRA's Accident Investigation Report HQ-2013-31, regarding the Casselton, ND accident on December 30, 2013 is available online at https://railroads.dot.gov/elibrary/hq-2013-31-finalized#p1_z50_gD_lAC_y2013.

[42] The grain train was operated by a three-person crew when it derailed. The three-person crew included a locomotive engineer, a conductor, and a student locomotive engineer (i.e., a conductor training to be a locomotive engineer). In addition, a supervisor (Road Foreman of Engines) was on board the train to test the student. The supervisor was not on the train when the crew took mitigating actions requested by local emergency first responders, as the three-person crew and the supervisor got off the train and walked to meet a railroad employee in a motor vehicle who had been waiting to pick up the supervisor. It was while the crew was with the supervisor that local emergency responders requested the crew's assistance, but the crew had to call a trainmaster to receive permission to comply with the request. FRA attributes the mitigating actions to the two certified crewmembers, as any operation of the locomotive or train by the student was under the supervision of the certified locomotive engineer. *Id.*

Board (NTSB) describes the grain train crew's first mitigating actions as occurring contemporaneously with the crew's movement and arrival at a nearby highway-rail grade crossing at which they were met by the assistant fire chief of the Casselton Fire Department who made the request for them to assist emergency responders.[43] The second set of mitigating actions is described as occurring 30 to 45 minutes after the grain train crew completed moving the first set of cars away from the fire.[44] The grain train's two certified crewmembers were thus responsible for moving approximately 70 loaded crude oil cars in the key train out of harm's way.

In the meantime, the alert key train crewmembers during the Casselton incident were able to survive the impact of the collision, escape their locomotive, which was on fire and had a jammed front door, and alert the dispatcher to the collision, largely based on a series of team related actions. Without teamwork, there were factors indicating a one-person crew might not have survived. For instance, the conductor admitted that he had never been in a situation where a collision was imminent, did not know what to do, and therefore might not have gotten down on the floor and braced himself, as the locomotive engineer instructed.[45] Also, a one-person crew might not have been in a position to see out the window and notice the train was on fire, as the conductor did in this case and warn the engineer of the fire danger. Upon exiting the locomotive, the crew found themselves in knee-deep snow and it was only about a minute later that the locomotive was engulfed in flames.[46] Thus, if a one-person crew were slower than the key train's two-person crew to evaluate the dangers, take action to protect him- or herself during the imminent collision, and subsequently evacuate the locomotive, that one-person might not have been able to survive the accident.

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[43] NTSB Railroad Accident Brief (RAB) 1701 at 5 (available in the docket as "Casselton NTSB RAB1701.pdf").
[44] *Id*.
[45] 81 FR 13924.
[46] *Id.*

Similar to the proposals in this NPRM, the 2016 NPRM generally proposed to require a minimum of two crewmembers for all railroad operations except operations determined to not pose significant safety risk to railroad employees, the general public, and the environment. Also similar to this proposed rule, the 2016 NPRM proposed special approval processes to allow an existing, less than two crewmember operation to continue and to allow the initiation of a new, less than two crewmember operation. The approval processes proposed in the 2016 NPRM, however, contemplated that a requesting railroad would provide a description of the existing or proposed operation(s), along with "appropriate data or analysis, or both" or a "safety analysis . . . including any information regarding the safety history of the operation" to enable FRA to determine whether the proposed operation would provide "at least an appropriate level of safety."[47]

On May 29, 2019, FRA withdrew the 2016 NPRM.[48] In the 2019 notification of withdrawal (2019 Withdrawal), FRA provided a general summary of the nearly 1,600 comments on the 2016 NPRM from industry stakeholders and individuals, including current, former, and retired crewmembers, the NTSB, two members of Congress, and numerous State and local government officials.

Although 1,545 of the comments supported the regulation of crew staffing, FRA explained that it was withdrawing the 2016 NPRM for several reasons. For instance, FRA concluded in the 2019 Withdrawal that the connections between train crew staffing and railroad safety with respect to the Lac-Mégantic and Casselton accidents are tangential at best and do not provide a sufficient basis for FRA regulation of train crew staffing requirements.[49] FRA also explained that FRA's accident/incident safety data[50] did not establish that one-person operations are less safe than multi-person train crews.[51]

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[47] 81 FR 13965-66.
[48] 84 FR 24735.
[49] 84 FR 24738.
[50] 49 CFR part 225, Railroad Accidents/Incidents: Reports Classification, and Investigations.
[51] 84 FR 24739.

Similarly, FRA concluded that the comments did not provide conclusive data suggesting that there have been any previous accidents involving one-person crew operations that could have been avoided by adding a second crewmember or that one-person crew operations are less safe.[52] In addition, FRA found that implementation of a train crew staffing rule would establish a potential barrier to automation or other technology improvements.[53] In issuing the 2019 Withdrawal, FRA noted its view that consideration and rejection of a Federal crew staffing requirement preempted all State laws attempting to regulate train crew staffing in any manner.[54]

Four separate lawsuits were filed challenging the 2019 Withdrawal, which were consolidated in the U.S. Court of Appeals for the Ninth Circuit (Ninth Circuit). Petitioners included the Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Workers and the Brotherhood of Locomotive Engineers and Trainmen filing jointly, and three States (California, Washington, and Nevada) filing separately. On February 23, 2021, the Court vacated FRA's withdrawal and preemption determination, and remanded the rulemaking to FRA.[55]

The proposals in this NPRM are similar to many aspects of the 2016 NPRM, but this proposed rule's risk assessment and annual oversight requirements are intended to enable FRA to play a more active role in ensuring that railroads appropriately consider any relevant safety risks that may arise from train operations using less than two person crews. The risk assessment requirement of this proposed rule is also designed to ensure that, to the extent practicable, railroads follow a uniform standard in evaluating the risks of the proposed operations.

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[52] 84 FR 24740.
[53] *Id*.
[54] 84 FR 24741.
[55] *Transp. Div. of the Int'l Ass'n of Sheet Metal, Air, Rail & Transp. Workers v. FRA*, 988 F.3d 1170, 1184-85 (9th Cir. 2021).

In this NPRM, FRA occasionally cites to the 2016 NPRM and 2019 Withdrawal; however, those citations are for reference purposes. This rulemaking is not a continuation of the prior rulemaking and instead stands on its own as a new proposed rule.

C. Preemption

Of particular concern to FRA is the patchwork of State laws regulating crew size in some manner and the impact of those various State requirements on safe rail operations.[56] In the 2019 Withdrawal, FRA explained that provisions of the Federal railroad safety statutes, specifically the former Federal Railroad Safety Act of 1970 (FRSA), repealed and recodified at 49 U.S.C. 20106, mandate that laws, regulations, and orders "related to railroad safety" be nationally uniform.[57] The FRSA provides that a State law is preempted where FRA, under authority delegated from the Secretary of Transportation, "prescribes a regulation or issues an order covering the subject matter of the State requirement."[58] A Federal regulation or order covers the subject matter of a State law where "the federal regulations substantially subsume the subject matter of the relevant state law."[59] A Federal regulation or order need not be identical to the State law to cover the same subject matter. The Supreme Court has held preemption can be found from "related safety regulations" and "the context of the overall structure of the regulations."[60] Federal and State actions cover the same subject matter when they address the same railroad safety concerns.[61]

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[56] 84 FR 24741(describing how FRA believes nine States have laws in place regulating crew size in some manner and laws regulating crew size have been proposed in 30 States since 2015).
[57] 49 U.S.C. 20106(a)(1).
[58] 49 U.S.C. 20106(a)(2). 49 U.S.C. 20106(a)(2).
[59] *CSX Transportation, Inc. v. Easterwood,* 507 U.S. 658, 664-65 (1993).
[60] *Easterwood*, 507 U.S. at 674.
[61] *Burlington Northern R.R. v. Montana*, 880 F.2d 1104, 1105 (9th Cir. 1989).

FRSA's preemption provision includes a "narrow exception"[62] to FRA's broad authority to preempt State laws. This narrow exception allows non-Federal regulation of "essentially local" safety hazards.[63] An "essentially local safety hazard" is "one which is not adequately encompassed within national uniform standards."[64] Meanwhile, the State laws at issue do not address an "essentially local" hazard because they would apply statewide.[65] Thus, legislative history and subsequent judicial decisions indicate the narrow exception is intended to allow States to respond to local situations not capable of being adequately addressed in uniform national standards, but local safety hazards cannot be Statewide.[66]

For these reasons, if FRA issues a final rule establishing minimum safety requirements for the size of train crews, it would cover the same subject matter as the State laws regulating crew size, and therefore FRA expects a final rule will have preemptive effect on those State laws that are Statewide in character and do not address narrow, local safety hazards. In the alternative, to address FRA's concern regarding the patchwork of State laws on crew size, FRA could articulate FRA's preemption of crew size requirements through a rulemaking without establishing minimum crew size requirements. FRA did not propose this alternative as it would not address the various safety concerns raised in this rulemaking. Further, FRA recognizes that if the issue of crew size safety is left to be governed by a patchwork of State laws, logistically it may become impossible for a railroad to even consider operations with fewer than two crewmembers. Thus, this rulemaking is intended to ensure railroads have the flexibility

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[62] *Duluth, Winnipeg & Pac. Ry. Co. v. City of Orr*, 529 F.3d 794, 796 (8th Cir. 2008).
[63] 49 U.S.C. 20106(a)(2).
[64] *Union Pacific R. Co. v. California Pub. Utils. Comm'n*, 346 F.3d 851, 860 (9th Cir. 2003).
[65] 49 U.S.C. 20106(a)(2); H.R. Rep. No. 91-1194 (1970), *reprinted in* 1970 U.S.C.C.A.N. 4104, 4117 ("these local hazards would not be statewide in character"); *see also Norfolk & Western Ry. Co. v. Public Utilities Comm'n of Ohio*, 926 F.2d 567, 571 (6th Cir. 1991) and *National Ass'n of Regulatory Util. Comm'rs v. Coleman*, 542 F.2d 11, 14-15 (3d Cir. 1976) (both holding that the local hazard exception cannot be applied to uphold the application of a statewide rule).
[66] H.R. Rep. No. 91-1194 (1970), *reprinted in* 1970 U.S.C.C.A.N. 4104, 4117.

to consider changes in crew size for individual operations based on an objective analysis of the safety and risks of the operation. FRA would appreciate comments on this issue.

D. Reconsideration of the Safety Issues

The Ninth Circuit's decision to vacate and remand the 2019 Withdrawal left FRA with the decision of whether to leave the issue of crew size safety to the status quo, initiate a rulemaking solely to have preemptive effect on the patchwork of State laws regulating crew size, or initiate a new rulemaking to address both safety issues and the preemption issue. In addition to the concern that a patchwork of State laws regulating crew size in some manner may impact safe rail operations due to the potential for crew consist size changes as trains cross State lines and any associated risks, FRA found several other safety issues to reconsider. For instance, upon reflection, FRA over-relied on the absence of single-person crew safety data to support its 2019 Withdrawal, because there have been too few current one-person train crew operations to create any meaningful data. The lack of safety data reflects the paucity of data; it does not support any conclusions about the safety of single-person crews.[67]

FRA's 2019 Withdrawal also downplayed other safety concerns, such as the views expressed in approximately 1,545 comments of the nearly 1,600 received that supported the 2016 NPRM and the lessons learned from the Lac-Mégantic and Casselton accidents. As discussed above, the 2019 Withdrawal focused on the causes of the Lac-Mégantic and Casselton accidents and found the connections between crew staffing and railroad safety "tangential at best" and that "the same type of positive post-accident mitigating actions" by the multi-person crews achievable with "a well-planned, post-accident protocol that quickly brings railroad employees to the scene of an accident."[68]

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[67] *See Transp. Div. of the Int'l Ass'n of Sheet Metal, Air, Rail & Transp. Workers v. FRA*, 988 F.3d 1170, 1182 (9th Cir. 2021) ("Critically, this lack of data does not support the promulgation of a one-person train crew rule and the preemption of state safety laws.").
[68] 84 FR 24738.

However, there is no Federal requirement for such a well-planned, post-accident protocol in such instances and thus there are no assurances that a railroad with a one-person train operation will initiate a safety protocol that could substitute for how multiple crewmembers, working as a team, could help prevent harm (Lac-Mégantic) and support each other during life-threatening conditions while helping to mitigate post-accident harm (Casselton).

Another issue FRA is reconsidering is the 2019 Withdrawal's reference to DOT's focus on removing unnecessary barriers to automation by "issuing voluntary guidance, rather than regulations that could stifle innovation."[69] In revisiting the conclusion in the 2019 Withdrawal that an FRA "train crew staffing rule would unnecessarily impede the future of rail innovation and automation," FRA finds that a train crew staffing rule would not necessarily halt rail innovation or automation. Notwithstanding the statements made in the 2019 Withdrawal, as detailed below, FRA has reexamined and reevaluated the safety issues associated with train operations involving fewer than two person crews, and based on this reevaluation, FRA has concluded that a rule addressing crew size could effectively serve as a tool to ensure new technologies involving automation and other rail innovations are thoroughly reviewed and shown to be consistent with railroad safety before they are implemented. DOT's current policy priorities include, but are not limited to, ensuring that "[i]nnovations should reduce deaths and serious injuries on our Nation's transportation network, while committing to the highest standards of safety across technologies."[70] Under these policy priorities, FRA finds that a train crew size safety rule, as proposed in this NPRM, could better ensure that railroads implementing innovative technologies and automation: (1) achieve increased rail safety, or (2) at a

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[69] 84 FR 24740.
[70] U.S. DOT Innovation Principles. https://www.transportation.gov/priorities/innovation/us-dot-innovation-principles.

minimum, do not introduce additional risk into railroad operations. In other words, safety continues to be DOT's top priority, and, rather than issue voluntary guidance, this NPRM would require regulated entities to analyze and demonstrate how innovations are consistent with safety, and receive FRA's approval, before implementing the technologies.

Further, the 2019 Withdrawal did not consider how technological trends and operational changes, especially on Class I freight railroads since 2016, have impacted safety or may impact safety in the future. The growth in the number of trains with more than 150 rail cars is a business practice that FRA has observed over the past several years,[71] and this change, along with other operational changes, may have cascading safety impacts unless mitigated by technology, training, or other processes. Through this proposed rulemaking, FRA is seeking to formalize the agency's role in reviewing and ensuring railroads complete thorough risk assessments before using fewer than two persons to crew any train.

The sections below discuss safety issues and impacts that may arise from train operations with fewer than two train crewmembers. FRA requests comments and data on the identified issues and other safety concerns that may stem from train operations with fewer than two crewmembers.

1. Revisiting Research on the Cognitive and Collaborative Demands of Crewmembers

The 2016 NPRM described, and the docket for this rulemaking contains, five FRA-sponsored research reports, and one Transportation Research Board conference report, that contain presentations from multiple research reports, identifying many safety

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[71] U.S. Government Accountability Office (GAO), Report to Congressional Requesters "Rail Safety: Freight Trains Are Getting Longer, and Additional Information is Needed to Assess Their Impact: at 11 (May 2019)(GAO-19-443). https://www.gao.gov/assets/gao-19-443.pdf. (corroborating FRA's finding that freight train-length has increased in recent years, even though there is limited data available).

considerations with reducing train crew staffing to fewer than two persons.[72] In the 2019 Withdrawal, FRA stated that "[w]hile these reports identify safety issues that railroads should consider when evaluating any reduction in the number of train crewmembers or a shift in responsibilities among those crewmembers, the reports do not indicate that one-person crew operations are less safe and therefore do not form a sufficient basis for a final rule on crew staffing."[73] Also, as previously discussed, the Ninth Circuit vacated the 2019 Withdrawal, in part because it found that FRA's conclusions "fail[ed] to address the multiple safety concerns raised by commenters and the research."[74] In consideration of FRA's current policy priorities, FRA finds that the 2019 Withdrawal overweighted a lack of safety data and de-emphasized safety concerns raised by the research. Thus, FRA revisits the research in this background to explain how the safety concerns the research raises helped in the development of the proposed requirements for this rulemaking.

The research identified a multitude of cognitive and collaborative demands placed on passenger train conductors,[75] freight train conductors,[76] and locomotive engineers.[77] For example, the research identified five categories of cognitive job duties for freight conductors that included managing the train consist and train makeup; coordinating with the engineer for safe and efficient en route operations; communicating with non-crewmembers, such as dispatchers, customers, and roadway workers; diagnosing and

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[72] 81 FR 13924-30.
[73] 84 FR 24740.
[74] *Transp. Div. of the Int'l Ass'n of Sheet Metal, Air, Rail & Transp. Workers v. FRA*, 988 F.3d at 1183 (9th Cir. 2021).
[75] *Rail Industry Job Analysis: Passenger Conductor*, Final Report, dated February 2013, DOT/FRA/ORD-13/07. This research report was prepared by the John A. Volpe National Transportation Systems Center. https://www.fra.dot.gov/eLib/details/L04321.
[76] *Cognitive and Collaborative Demands of Freight Conductor Activities: Results and Implications of a Cognitive Task Analysis–Human Factors in Railroad Operations*, Final Report, dated July 2012, DOT/FRA/ORD-12/13. This research report was prepared by the John A. Volpe National Transportation Systems Center. https://www.fra.dot.gov/eLib/details/L04331.
[77] *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. This research report was prepared by the John A. Volpe National Transportation Systems Center. https://railroads.dot.gov/elibrary/technology-implications-cognitive-task-analysis-locomotive-engineers.

responding to train problems and other exceptional situations; and, managing the train crew's paperwork.[78] This research on the cognitive job duties for freight conductors concluded that although the freight conductor has a distinct set of formal responsibilities, the conductor and locomotive engineer operate as an integrated team, contributing knowledge and backing each other up as necessary.[79] If a conductor is handling all radio communication duties and taking care of paperwork when the train is in motion, the safety benefit is that the engineer can concentrate on operating the train.[80] Other research identified why railroad workers are at risk of fatigue and raised the issue of whether a railroad implementing a one-person train crew operation adopted strategies for reducing railroad worker fatigue.[81] Such strategies include improving the predictability of schedules, considering the time of day permitted for one-person train crews to operate, educating workers about fatigue and sleep disorders, and implementing redundancy backstops in case the crewmember falls asleep while performing safety-sensitive tasks.

Research explains that there are critical components to building effective teams.[82] Individuals that form expert teams engage in a regular cycle of pre-brief, performance, and debrief. This performance cycle engages the individuals that form expert teams to identify high and low priorities, revise goals and plans, identify lessons learned, and evaluate whether the team is effective both in performing its tasks and identifying the needs of team members. The research regarding teamwork in U.S. railroad operations[83] concludes that the main advantage of developing individuals who engage in that regular

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[78] *Cognitive and Collaborative Demands of Freight Conductor Activities: Results and Implications of a Cognitive Task Analysis–Human Factors in Railroad Operations* at 2.
[79] *Id*. at 42.
[80] *Id*. at 2.
[81] *Fatigue Status in the U.S. Railroad Industry*, Final Report, dated February 2013, DOT/FRA/ORD-13/06. https://railroads.dot.gov/elibrary/fatigue-status-us-railroad-industry. This research report was prepared by QinetiQ North America and an Engineering Psychologist within FRA's Office of Research and Development.
[82] *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. https://onlinepubs.trb.org/onlinepubs/circulars/ec159.pdf.
[83] *Id*. at 17.

briefing cycle is that they can work with other properly trained individuals to form an expert team that can be expected to have higher levels of performance than non-expert teams. For example, properly trained individuals that are assigned a duty tour together on any given day will form an expert team that makes better decisions and fewer errors, which in turn enables the expert team to have a higher probability of mission success.[84]

The research raised additional safety concerns regarding one-person train crews, such as the loss of low workload periods during which teams have time to plan ahead,[85] the loss of a second crewmember to notice and correct errors,[86] and the difficulty some crewmembers may have working alone.[87] Similarly, the research highlighted that having a two-person crew broadens the number of experiences from which the crew can draw from to effectively problem-solve, plan ahead, or identify and avoid potential hazards.[88]

The research describing the technology implications of a cognitive task analysis for locomotive engineers also suggests why implementing PTC could create new sources of workload and distraction and thus should not be presumed to lead to fewer tasks for the crew to do, nor make it easier to accomplish the tasks with a single person until the issue can be studied.[89] Traditionally, 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

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[84] *Id*.
[85] *Id*. at 30.
[86] *Id*. at 19.
[87] *Id*. at 3-4, 13-14.
[88] *Id*. at 5, 34.
[89] *Technology Implications of a Cognitive Task Analysis for Locomotive Engineers–Human Factors in Railroad Operations* at 38-40. 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).

with a portion of track or a smell that reminds them they are near a farm.[90] The research suggests that PTC technology may require locomotive engineers to focus more on in-cab displays and thereby reduce their ability to monitor activity outside the cab.[91] This raises the question of whether engineers will lose some of the situational awareness that helps them perceive where the train is based on their prior experiences. Typically, a locomotive engineer will use that situational awareness to help anticipate future events. Furthermore, the research concluded that train crews must avoid too much reliance on new train control technologies because, if the system ever fails, the engineer must be able to operate the train safely or bring the train to a safe stop until the technology is repaired.[92]

2. Current Regulatory Weaknesses

In the 2016 NPRM's background section, FRA explained that many of the Federal rail safety regulations were written with the expectation that each train would have multiple crewmembers.[93] FRA cited six different railroad safety scenarios in the 2016 NPRM raising safety concerns.[94] While FRA noted in the 2019 Withdrawal that none of the scenarios cited in the 2016 NPRM require a minimum number of crewmembers to achieve compliance, the implementation of a one-person operation, without any off-setting measures, may render existing rail safety requirements either less effective or ineffective. This may be especially true for prohibited conduct that is not always easy for railroad officers who conduct operational tests and inspections to

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[90] *Technology Implications of a Cognitive Task Analysis for Locomotive Engineers–Human Factors in Railroad Operations* at 17.
[91] *Id*. at 45.
[92] *Using Cognitive Task Analysis to Inform Issues in Human Systems Integration in Railroad Operations–Human Factors in Railroad Operations* at 25, Final Report, dated May 2013, DOT/FRA/ORD-13/31 This research report was prepared by the John A. Volpe National Transportation Systems Center. https://www.fra.dot.gov/eLib/details/L04589.
[93] 81 FR 13932-34.
[94] *Id*.

detect.[95] For example, a second crewmember's presence or reminder of an electronic device prohibition could act as a deterrent to any prohibited use. A second crewmember can vigilantly monitor the safe movement of the train when prohibited conduct is detected or stop the train to report the inappropriate electronic device usage. If prohibited conduct is a contributing cause to an accident/incident, a second crewmember may provide evidence during an investigation. Although it is possible that inward-facing cameras in the locomotive cab could equally act as a deterrent to prohibited electronic device use and provide valuable information during a post-accident investigation, such cameras are currently not required and have not been installed voluntarily on all locomotives industry-wide. Consistent with the statutory mandate on which it is based,[96] FRA did not propose an inward-facing camera requirement for freight locomotives in its notice of proposed rulemaking regarding locomotive image and audio recording devices (Recording Devices NPRM).[97] FRA has not yet issued the Recording Devices final rule. FRA considered proposing an inward-facing camera requirement for freight locomotives in this train crew size safety proposed rule but declined to do so. Although these recording devices could act as a deterrent and provide valuable information during a post-accident investigation, the devices would not be as effective as a second crewmember who could more quickly take action when prohibited conduct is detected and also provide critical evidence during an investigation that a recording device did not capture. Accordingly, without inward-facing cameras in the locomotive cab, FRA would expect a railroad's risk assessment for a one-person train crew operation would identify this hazard and appropriate mitigation actions. Such mitigation might include requiring frequent supervisory monitoring during a tour of duty. As an alternative to the proposed

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[95] For example, FRA requires each railroad to maintain a program of operational tests and inspections, and the railroad officers who conduct the tests or inspections to be trained and qualified. 49 CFR 217.9.
[96] *See* 49 U.S.C. 20168.
[97] 84 FR 35712, 35713 (July 24, 2019).

risk assessment requirement, FRA requests comment on whether other specific actions should be mandated (e.g., frequent supervisory monitoring during a tour of duty or similar interactions that would discourage a one-person crewmember from violating the prohibitions on electronic device use).

In the 2016 NPRM, FRA also raised various other concerns related to crewmember distraction, whether by prohibited electronic devices, radio transmissions, interfacing with railroad-approved on-board electronic systems, or other crewmembers. For instance, although research suggests properly trained teams should not distract one another, FRA anticipates that some commenters will take the position that a second crewmember is a source of distraction and could add to the number of persons killed or seriously injured when an accident occurs. As in 2016, such instances of crewmember distraction are likely rare, but FRA does not have readily available information for estimating such countervailing impacts of this proposed rule.[98] In the justification for the final rule restricting railroad operating employees from using cellular telephones and other electronic devices, FRA stated that "it is difficult to identify distraction and its role in a crash" if it goes unreported by the operator of the vehicle.[99] In FRA's view, the potential for a second crewmember distracting another crewmember is balanced by the greater likelihood that a properly trained second crewmember acts as a deterrent to prohibited conduct and can monitor the other crewmember's attentiveness.

FRA also explained in the 2016 NPRM how a one-person train crew has more opportunity to conceal a drug or alcohol violation than the person would if there were two or more crewmembers. For instance, FRA has requirements for most railroads to conduct random testing, reasonable cause testing, and to implement self/co-worker

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[98] 81 FR 13919.

[99] 75 FR 59580, 59582 (Sep. 27, 2010) (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).

referral programs.[100] However, even if a one-person train crew is subject to random and reasonable cause testing and referral programs under part 219, the person will not be tested before, during, or after every tour of duty. With multiple train crewmembers, another crewmember might suspect that a person has used, or is using or possessing alcohol or drugs on railroad property.[101] If a railroad were to use a one-person train crew, there is no current requirement that supervisors initiate any procedures to substitute for that lack of contact with other railroad personnel. Under this proposed rule, FRA would expect a railroad's risk assessment for a one-person train crew operation to address this hazard and mitigate this risk. Such mitigation might include requiring a one-person train crew to have face-to-face meetings with supervisors at the beginning and end of each tour of duty, or more frequent supervisory monitoring during a tour of duty; other types of mitigation may also be appropriate. FRA finds that a railroad seeking to implement a less than two-person crew operation would be in the best position to identify its own mitigation strategies. As alternative options to the proposed risk assessment, FRA considered whether to require those face-to-face meetings with supervisors at the beginning and end of each tour of duty, or more frequent supervisory monitoring during a tour of duty, or similar interactions that would discourage a one-person crewmember from violating the prohibitions on alcohol and drug use. FRA requests comment on this issue, including comments on whether each railroad that continues a legacy operation under proposed § 218.131(b)(12) and/or each railroad that implements certain specific

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[100] *See* 49 CFR part 219.

[101] 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 referral programs 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 219.1001 through 219.1007 (permitting a railroad to implement alternate referral programs with the written concurrence of the recognized representatives of the regulated employees). The referral programs make 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.

freight train operations proposed for exception under § 218.129(b) should be required to adopt and comply with a railroad operating rule or practice whereby those one-person train crewmembers must have face-to-face meetings with supervisors at the beginning and end of each tour of duty, or more frequent supervisory monitoring during a tour of duty.

FRA also finds that safety is diminished when employees no longer need to discuss their work, and the processes or requirements they must follow, at regular intervals.[102] For this reason, FRA's regulations contain job briefing requirements for train crewmembers and other operating employees. For example, FRA requires train crewmembers to hold job briefings when conducting shoving or pushing movements,[103] when operating or verifying the position of a hand-operated switch,[104] when a utility employee commences duties with a train crew,[105] and when, under certain conditions, a railroad operating employee wants to use a railroad-supplied electronic device in the cab of the controlling locomotive.[106] These job briefing requirements typically are required before work is begun, each time a work plan is changed, and upon completion of the work.

Not only are job briefings relevant to rail safety because the employees must coordinate their work, but the briefings are also relevant to rail safety as a way to share information and experiences. The voluntary sharing of knowledge and experiences is a safety issue raised in research describing the value of intermediate or rolling job briefs

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[102] For instance, in the context of roadway maintenance, FRA issued guidance reminding the regulated community of the importance of job safety briefings for activities that fall outside of FRA's safety regulations but that may be subject to the U.S. Occupational Safety and Health Administration's (OSHA) regulations requiring briefings. FRA explained that "[j]ob safety briefings, specific to the task or tasks to be performed, provide a mechanism to not only communicate identified risks to every member of the roadway work group, but to also ensure that the roadway work group agrees as to how the identified risks will be mitigated." 81 FR 85674, 85675 (Nov. 28, 2016) (citing Safety Advisory 2016-02, "Identification and Mitigation of Hazards Through Job Safety Briefings and Hazard Recognition Strategies).
[103] 49 CFR 218.99(b)(1).
[104] 49 CFR 218.103(b)(1).
[105] 49 CFR 218.22(c)(4).
[106] 49 CFR 220.307(c)(1).

that are informally initiated en route before performing particularly challenging tasks.[107] These informal practices are described as going beyond the requirements of formal rules and procedures as including "proactive communications intended to foster common ground, redundancy checks intended to reduce the possibility of error; and proactive actions intended to level workload and facilitate work across the distributed organization."[108] The research concludes that the act of discussing potential hazards enables crewmembers to be better prepared, especially when less experienced crewmembers might fail to identify and avoid those hazards unbeknownst to them.[109] This finding is a significant factor in the research's overall conclusion that "train crews . . . were shown to exhibit characteristics of high performing teams that have been found across industries [specifically including] mutual performance monitoring and active support of each other's activities (e.g., backup behavior)."[110] For these reasons, a one-person train crew that lacks a job briefing requirement may be less prepared, and thus less safe, than a two-person train crew unless a job briefing requirement with a non-crewmember is added for certain tasks or situations. A railroad that conducts a risk assessment, like the one proposed in this rulemaking, would likely be in the best position to decide when job briefings with non-crewmembers could be a reasonable alternative to job briefings with other crewmembers because such job briefings would capture the benefits of high-performing teams and mitigate risk.

Without the proposed risk assessment requirements, FRA alternatively considered requiring more frequent communications between a one-person crew and non-crewmembers. However, in considering such an alternative, it is difficult to know how, if

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[107] *Teamwork in Railroad Operations and Implications for New Technology*, Final Report, dated May 2020, DOT/FRA/ORD-20/01. This research report was prepared by the John A. Volpe National Transportation Systems Center. https://railroads.dot.gov/elibrary/teamwork-railroad-operations-and-implications-new-technology.
[108] *Id.*at 28.
[109] *Id.*at 13.
[110] *Id.*at 28.

at all, such a communication requirement could reliably ensure the specific hazards of a train operation are identified and addressed. For example, the appropriate alternative non-crewmember(s) required to participate in the job briefing would need to be identified. FRA would likely need to address railroad operations more broadly than any individual railroad with knowledge of its own operations. FRA suspects that such a job briefing with non-crewmembers may only be needed in complex situations, not every time work conditions or situations change, and the addition of a job briefing requirement with a person other than a train crewmember could be addressed in a special approval petition or by FRA during the proposed approval process rather than an alternative FRA regulatory requirement. The addition of job briefings across the larger distributed team[111] made up of dispatchers, train crews, operational managers, and roadway workers is part of current, informal cooperative practices that contribute to safe and efficient performance across a railroad.[112] Thus, FRA expects that a railroad's risk assessment would best address the job briefing issue. Alternatively, FRA requests comment on whether FRA should add job briefing requirements to address the safety implications of a train operation with a one-person crew.

Additionally, other operational tasks are more difficult with a one-person train crew. For instance, FRA requires that an employee copying a mandatory directive received by radio transmission not be operating the controls of moving equipment.[113] Thus, a one-person train crew would have to stop the train to receive a mandatory directive that was transmitted by radio—even in circumstances, such as steep grade, that would make stopping the train logistically difficult. A railroad's risk assessment would be expected to identify the hazard of a steep grade and how mandatory directives will be

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[111] *Id.*at 5 (explaining that distributed teams are distributed geographically and the team participants may or may not be members of the same craft, although they may need to communicate and coordinate to accomplish work safely and efficiently).
[112] *Id.*at 28.
[113] *See* 49 CFR 220.61.

conveyed safely to mitigate such risk. Although FRA believes a risk assessment provides the best option to identify hazards regarding mandatory directives received by radio transmission and allow each railroad to devise its own mitigation strategies, FRA requests comment on other options, such as the option FRA considered to prohibit the conveyance of a mandatory directive by radio when a one-person crew is operating a train on a steep grade.

Another operational issue that could be addressed in the proposed risk assessment is how a railroad with a one-person train crew plans to handle situations in which the controlling locomotive's radio fails en route. With a two-person crew, one person can operate the train while a second person communicates with the dispatcher from a second locomotive that has a working radio. A one-person crew would not have this workaround.[114] Without this workaround and without a risk assessment addressing this hazard, FRA alternatively considered that the current requirements, allowing the train to continue until the earlier of the next calendar day inspection or reaching the nearest forward repair point, are too lenient.[115] For instance, FRA considered an alternative option of adding to the current regulatory requirements that, when a controlling locomotive has a radio or wireless communication device that fails en route, a one-person train crew is prohibited from continuing beyond a location where a second crewmember can be safely added to the train. Thus, the alternative prohibition FRA considered would be significantly more stringent than the current rule, as FRA would expect the train to be stopped and a second crewmember added at any location where the train can be safely stopped and a crewmember can be safely added, which would likely be at a location much closer than a repair point in most situations. FRA requests comments regarding

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[114] 49 CFR 220.38 (describing the requirements for train operations in the event of a communication equipment failure).
[115] *Id.*

why this alternative option might be preferable to the risk assessment as proposed, or whether there are alternative options.

FRA also expects the proposed, railroad-developed risk assessments will address the hazards associated with how often and under what conditions a one-person train crew will be expected to leave the locomotive cab to throw a switch, operate through it, and then leave the locomotive cab again to return the switch to its previous, normal state.[116] In this rulemaking, FRA proposed that, under certain operations specified by exceptions and legacy operations, "a one-person train crewmember must remain in the locomotive cab during normal operations and may leave the locomotive cab only in case of an emergency affecting railroad operations."[117] FRA considered extending this type of proposed prohibition as an alternative to a risk assessment for other one-person train operations under proposed § 218.133, but chose a risk assessment as the best option because it would allow each railroad to consider the hazards and mitigate the risks knowing the extent of its operation. FRA would appreciate comments on this alternative prohibition option or other options that would address the hazards associated with how often and under what conditions a one-person train crew will be expected to leave the locomotive cab.

Further, the 2016 NPRM described how, in the event of a highway-rail grade crossing activation failure, i.e., when the warning lights do not flash or the gates do not come down to stop motor vehicle traffic, motor vehicle traffic must be warned of an approaching train and a one-person crew could not stop and flag the crossing without a non-crewmember flagger or a uniformed law enforcement officer's assistance.[118] While complying with the current activation failure requirements with fewer than two

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[116] *See* 49 CFR 218.103 through 218.107 (requiring each railroad to adopt and comply with operating rule requirements for operating hand-operated switches).
[117] *See* proposed 49 CFR 218.129(b) and 218.131(b)(12)(i).
[118] 81 FR 13934 (citing 49 CFR 234.105).

crewmembers is possible, there are no current Federal requirements that a railroad have an effective plan for quickly protecting the crossing and moving the train so it is not blocking other crossings that have passive warning devices only. Similar to other operational safety hazards mentioned in this background, describing how the current regulations were written for multi-person train crews, FRA expects that the risk assessment proposed in this rulemaking would be the best option because it would require a railroad to maintain procedures that will promptly allow one-person train crews to protect highway-rail grade crossings where there has been an activation failure. Without a risk assessment requirement, FRA considered the alternative of mandating that a railroad with a one-person train operation establish operating rules or practices necessary to safely protect those crossings without undue delay. FRA would appreciate comments on the options considered and any alternative options.

Blocked highway-rail grade crossings, by trains traveling over or stopping on track crossed by a highway, are another operational safety hazard that FRA would expect a railroad to address in a proposed risk assessment for a one-person train crew operation. For instance, the proposed requirement of a risk assessment would be expected to address operational changes that increase hazards such as more frequently blocked crossings. A one-person train operation might increase blocked crossings when operating longer, slower, or more frequent trains, or by requiring trains to stop more frequently blocking highway-rail grade crossings for longer periods of time, but FRA cannot know whether this is likely to be the case without a risk assessment that describes the operation and its hazards.[119] Blocked crossings can lead to social costs due to increased travel times and inconvenience. In addition, crossings that are blocked for significant periods of time

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[119] GAO-19-443 at 17 (citing GAO-16-274 which reported that "the amount of time that highway-rail grade crossings are blocked depends on a number of factors and is typically a function of the number, speed, and length of trains).

could affect public safety. For example, recipients and providers of emergency medical services could be detrimentally impacted by extended delays caused by trains blocking highway access to crossings, as could police and fire department personnel responding to other types of community emergencies, a situation that could be exacerbated with an increase in one-person train crew operations.[120] For instance, each year there are news reports that blocked crossings have led to a delay in providing emergency services or getting someone to medical care, and that harm may have resulted as a consequence.[121] Also, when highway users are not given any advance warning of a blocked crossing or any information regarding when the crossing will no longer be blocked, motor vehicle drivers may feel they need to take risks to avoid waiting for the crossing to clear. Similarly, communities are concerned that longer trains may "prolong the duration of a blockage and can block more crossings concurrently, making it harder for vehicles to find an alternative route around the train."[122] FRA believes the best option to address this operational safety concern is by requiring the proposed risk assessment, which would allow the railroad to identify hazards and mitigate risk. Without a risk assessment option, FRA alternatively considered how to regulate one-person train operations so that each railroad, at a minimum, has a plan to unblock crossings when trains are stopped. FRA

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[120] GAO-19-443 at 17-22 (describing the various safety impacts blocked crossings may have on communities).

[121] For example, a news report describes how, on September 30, 2021, a mother gave CPR to her 3-month old boy for an hour while a train blocked a crossing preventing EMTs from providing help. The EMTs ended up walking between the train cars to get to the boy and, when returning to the ambulance, the train started moving so the EMTs had to wait until the train passed to cross the tracks back to the ambulance. It was reported that, according to the boy's mother, the delay allegedly contributed to the boy's death a couple of days later. Last visited at https://www.easttexasnews.com/index.php/polk-county-news-2/925-tragedy-on-the-tracks. In another example, a news report describes how a man in Tennessee died on May 17, 2021, after first responders were delayed reaching him allegedly due to a train that was blocking a crossing. Last visited at https://www.newschannel5.com/news/bedford-county-man-dies-after-train-blocks-ambulance-route. In addition, a news report describes how a man in September 2020 died after emergency vehicles coming to his aid were stuck behind a train at the only entrance to the man's street and that numerous calls were made to police for over two hours about the train blocking access. Last visited at https://www.8newsnow.com/news/oklahoma-family-sues-after-father-dies-while-emergency-vehicles-stuck-behind-train/. The three news articles will be available in the docket for the rulemaking (FRA-2021-0032).

[122] GAO-19-443 at 18.

would appreciate comments on these options or other alternative options to a risk assessment that would address how FRA could regulate one-person train operations so that the safety issue of trains blocking crossings is not made worse than when trains are operated by two or more crewmembers.

Without a train crew size safety requirements regulation, railroads could diminish the safety purposes of some existing regulatory requirements. Specifically, railroads could avoid fully considering the potential safety repercussions resulting from one-person crew operations or taking off-setting measures consistent with railroad safety. In addition, railroads lacking proper training, testing, or supervision programs for one-person crew operations could introduce new safety risks for neighboring communities. For these reasons, in reviewing and approving train operations with fewer than two crewmembers, FRA proposes to condition its approval of such operations on specific conditions necessary to ensure the approval is consistent with railroad safety. Further, as indicated in this background, FRA is proposing the risk assessment option because it is the best option, as it would allow each railroad to identify the hazards in its own operation and mitigate the risks to an acceptable level. FRA is interested to hear from commenters on both the risk assessment and alternative options considered and described in this background; however, considering that so many of the Federal rail safety regulations were written with the expectation that each train would have at least two crewmembers, FRA's position in this proposed rule is that new regulatory requirements are warranted to prevent one-person train operations from potentially degrading safety.

E. Transportation of Certain Hazardous Materials

DOT has long recognized that hazardous materials are essential to the economy of the U.S. and the well-being of its people, but incidents can occur involving releases or

security threats.[123] FRA coordinates with DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) to regulate and enforce the safe and secure transportation of hazardous materials by rail.[124] As a result of this shared role, PHMSA and FRA work closely when considering regulatory changes and the agencies take a system-wide, comprehensive approach consistent with the risks posed by the bulk transport of hazardous materials by rail. FRA and PHMSA also coordinate with the Department of Homeland Security and its Transportation Security Administration (TSA) on rail transportation security issues, as those agencies have the lead role in security matters.

Accordingly, to ensure the safety and security of the rail transportation of hazardous materials, PHMSA and FRA, in coordination with DHS, have historically promulgated rules subjecting certain hazardous materials to additional operational restrictions or requiring railroads to take certain actions to ensure the safe and secure rail transportation of these high-risk hazardous materials.[125] PHMSA's hazardous materials regulations are designed to achieve three goals: (1) ensure that hazardous materials are packaged and handled safely and securely during transportation; (2) provide effective communication to transportation workers and emergency responders of the hazards of the materials being transported; and (3) minimize the consequences of an incident should one occur.[126] The regulations categorize hazardous materials by analysis and experience into

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[123] *See e.g.,* 67 FR 22028 (May 2, 2002) (proposing new requirements to enhance the security of hazardous materials transported in commerce in the wake of the terrorist attacks of September 11, 2001).
[124] PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives. In advancement of its mission, PHMSA: establishes national policy; sets and enforces standards; educates; and conducts research to prevent incidents. PHMSA also prepares the public and first responders to reduce consequences if an incident does occur. PHMSA's standards include requirements for shipments and packaging during transportation of hazardous materials whether by rail, aircraft, vessel, or public highway.
[125] 49 CFR parts 171-180.
[126] 80 FR 26644, 26649 (May 8, 2015).

hazard classes and packing groups based upon the risks they present during transportation.

Because of the dangers of hazardous materials generally, and the additional dangers of a release in transit due to an accident, derailment, theft, or attack, DOT considers train crewmembers as "hazmat employees" requiring specific types of training.[127] These training requirements are substantial. For example, the types of training required for hazmat employees include general awareness/familiarization training, function-specific training, safety training that includes emergency response and exposure mitigation/protection measures, security awareness training, in-depth security training, and any other training required by other Federal agencies.[128] Further, these types of training are required initially and recurrently at least once every three years.[129] Considering these extensive training requirements for train crewmembers who are hazmat employees, the proposed train crew size safety requirements for trains carrying hazardous materials are complementary to existing DOT requirements that highlight the greater risks posed by certain types of shipments. The following background provides some historical explanation for why the train crew size safety requirements proposed in this rulemaking rule would prohibit transporting certain types of hazardous materials by train with a one-person crew.

A 2008 PHMSA final rule, for example, requires railroads to annually assess the safety and security risks of the routes over which the railroads transport certain hazardous materials because certain hazardous materials present greater risks than others.[130] For

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[127] 49 CFR 171.8 (defining "hazmat employees" by the type of work the person is employed to do). Locomotive engineers are hazmat employees because they operate a vehicle used to transport hazardous materials, as specified in paragraph (2)(v) of the definition of hazmat employees. Similarly, other train crewmembers, such as conductors, are responsible for the safety of transporting hazardous materials, paragraph (2)(iv), and directly affect hazardous materials transportation safety while employed by a hazmat employer, paragraph (1)(i).
[128] 49 CFR 172.704(a) and (b).
[129] 49 CFR 172.704(c).
[130] 73 FR 72182, 72193 (Nov. 26, 2008).

instance, a hazardous material may present a greater risk because of the potential consequences of an unintentional release of that material and the material's potential for use as a "weapon[] of opportunity or weapon[] of mass destruction."[131] For that reason, PHMSA specifically categorized materials poisonous by inhalation (PIH materials), certain radioactive materials, and certain explosives, as examples of materials presenting the greatest risk and required that railroads annually analyze the routes over which these materials are transported and available alternatives to determine the safest and most secure route.

Also in 2008, in response to a statutory mandate that implemented recommendations of the 9/11 Commission,[132] TSA similarly categorized certain rail shipments of hazardous materials as rail-security sensitive materials (RSSMs).[133] TSA added the RSSM term to denote that the Secretary of Homeland Security determined that certain "categories and quantities of hazardous materials . . . pose a significant risk to national security while being transported in commerce by rail due to the potential use of one or more of these materials in an act of terrorism."[134] Included within the definition of RSSMs are tank cars containing PIH materials and shipments of certain threshold quantities of explosive and radioactive materials.

After the 2013 catastrophic accident in Lac-Mégantic, Canada, Transport Canada issued a directive containing a specific requirement that railroads in Canada operate trains carrying loaded hazardous materials tank cars over main track and sidings with at least

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[131] *Id*. at 72184.
[132] Implementing the Recommendations of the 9/11 Commission Act of 2007, Pub. L. 110-53; 121 Stat. 266 (Aug. 3, 2007). The statute defined "security-sensitive material" as "a material, or group of materials, in a particular quantity and form that the Secretary of Homeland Security, in consultation with the Secretary of Transportation, determines through rulemaking with opportunity for public comment, poses a significant risk to national security while being transported in commerce."
[133] 73 FR 72130 (Nov. 26, 2008).
[134] *Id*. at 72134.

two crew members.[135] Canada replaced the temporary directive with a more permanent, minimum two crewmember operating requirement "for a freight train or transfer carrying one or more loaded tank cars of dangerous goods."[136] On August 7, 2013, FRA issued a safety advisory recommending that railroads review their crew staffing practices for over-the-road train movements of trains transporting five or more PIH tank car loads, or 20 or more rail car loads or intermodal portable tank loads of any Division 2.1 flammable gas, Class 3 flammable liquid or combustible liquid, Class 1.1 or 1.2 explosive, or other certain listed hazardous substances.[137]

Subsequently, in 2015, PHMSA addressed the risks of the rail transportation of large volumes of flammable liquids and imposed operational restrictions (e.g., speed limits, certain braking requirements, and route analysis requirements) on trains transporting large volumes of these materials. In doing so, PHMSA defined trains subject to these additional operational restrictions as "high-hazard flammable trains."[138] PHMSA acknowledged in the 2015 final rule that it did not directly address regulations governing human factors, but that it does indirectly address some of the issues through consideration of 27 safety and security factors as part of the routing requirements.[139] Several of those 27 safety and security factors that must be considered in the risk analysis

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[135] The emergency directive pursuant to section 33 of the Railway Safety Act was issued on July 23, 2013, approximately 17 days after the Lac-Mégantic accident and was set to remain in effect until the end of 2013. It is described in a safety advisory FRA issued after the accident, Safety Advisory 2013-06, cited below. Although the signed and dated directive is no longer available on Transport Canada's website, Transport Canada released this "Backgrounder" for research or reference: https://www.canada.ca/en/news/archive/2013/07/emergency-directive-pursuant-section-33-railway-safety-act.html. Transport Canada also lists the directive as issued on July 23, 2013 in a list of "Measures to enhance railway safety and the safe transportation of dangerous goods": https://tc.canada.ca/en/rail-transportation/rail-safety/measures-enhance-railway-safety-safe-transportation-dangerous-goods#wb-auto-4.

[136] Canadian Rail Operating Rules (CROR), General Rule-M(iii). https://tc.canada.ca/en/rail-transportation/rules/canadian-rail-operating-rules/general-rules.

[137] FRA Safety Advisory 2013-06, 78 FR 48224, 48228 (Aug. 7, 2013).

[138] 80 FR 26644, 2674626746 (May 8, 2015). The rule defined a "high-hazard flammable train" as "a single train transporting 20 or more loaded tank cars of a Class 3 flammable liquid in a continuous block or a single train carrying 35 or more loaded tank cars of a Class 3 flammable liquid throughout the train consist."

[139] *Id*. at 26651.

would likely place a larger burden on a one-person train crew, such as the volume of hazardous material transported, rail traffic density, trip length for route, the emergency response capability along the route, and the training and skill level of crews.[140] PHMSA's decision to indirectly address the human factors issues was driven by its understanding that "FRA has initiated a rulemaking to address the appropriate oversight to ensure safety related train crew size" as a separate, key regulatory safety initiative.[141]

Also in 2015, FRA issued a final rule amending existing securement requirements for unattended equipment, primarily for trains transporting PIH materials and large quantities of certain flammable hazardous materials.[142] Specifically, FRA found that the dangerous properties of PIH materials and large quantities of certain flammable and other hazardous materials (including certain explosives and hazardous substances) often compound the consequences of a rail accident should one occur.[143] Thus, FRA amended its regulations to require railroads to take additional measures to secure equipment containing a tank car load of PIH material or 20 or more loaded tank cars or loaded intermodal portable tanks of certain flammable, combustible, or explosive hazardous materials or certain designated hazardous substances.[144] For instance, FRA's 2015 final rule added a requirement to verify securement of certain unattended freight trains or cars containing the hazardous materials described above "with another person qualified to make the determination that the equipment is secured in accordance with the railroad's processes and procedures."[145] FRA's analysis for that requirement explained that a multi-person crew could satisfy the requirement or, where a one-person crew was involved, then the crewmember "would have to call the dispatcher or some other

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[140] 49 CFR part 172, appendix D.
[141] 80 FR 26654-55.
[142] 80 FR 47350 (Aug. 6, 2015).
[143] *Id*. at 47353-55.
[144] 49 CFR 232.103(n)(6)(i)(A) and (B).
[145] 49 CFR 232.103(n)(8)(i).

qualified railroad employee to verify with the qualified employee that the train had been properly secured."[146]

Based on the known safety and security risks associated with operating trains transporting large amounts of hazardous materials and with the hazardous materials known to present the greatest safety and security risks, as discussed in more detail in the section-by-section analysis of proposed § 218.123 below, in this NPRM FRA is proposing to prohibit the operation of trains transporting hazardous materials subject to FRA's securement regulation or materials designated by TSA as RSSMs on trains with fewer than two crewmembers.

F. Current Operations

Since FRA already has regulations requiring certain minimum standards for locomotive engineers and conductors,[147] FRA has chosen not to define the duties of the two required crewmembers in this proposed rule. Nearly every movement of a locomotive, whether the locomotive is coupled to other rolling equipment or not, requires that the operation be performed by a certified locomotive engineer.[148] For most current railroad operations, this is accomplished with a two-person train crew consisting of a locomotive engineer and a conductor. Train crews consisting of two people, one a locomotive engineer and the other a conductor, are universally the norm because that crewmember configuration provides the railroad with the necessary flexibility to assign the crew where operations have more complexity than a one-person crew can be expected to perform alone. That is, a train crew with both a locomotive engineer and conductor can be expected to work independently, without the need for the railroad to have separate plans regarding how the train will accomplish switching cars, protecting highway-rail

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[146] 80 FR 47372.
[147] 49 U.S.C. 20135 and 20163 and 49 CFR parts 240 and 242.
[148] 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).

grade crossings, and other safety-related tasks typically requiring more than just one-person. It is also more efficient with a conductor who can fill out any required paperwork and receive mandatory directives transmitted by radio while the locomotive engineer keeps the train moving.

Each current operation of a locomotive or train that requires a locomotive engineer is also required to have a conductor, but FRA recognizes that there are circumstances where a person is "serving as both the conductor and the engineer."[149] With a one-person train crew, the single crewmember must be dual-certified as a locomotive engineer and a conductor.[150] In this way, FRA currently requires that each locomotive or train must have a crew that can perform all the duties described by the qualifications requirements in FRA's locomotive engineer and conductor certification regulations.

FRA currently permits a train crew consisting of a certified locomotive engineer, who is not dual-certified as a conductor, and a second person who is a certified conductor attached to the train crew, but not traveling on the train.[151] As proposed, this rule would limit this practice to the excepted small railroad operations under proposed § 218.129(c)(1), as the NPRM would generally require crewmembers to be on their moving train and only would allow disembarking temporarily from the train to perform duties assigned.[152] Thus, a second person, even if that person is a certified conductor, would not be a train crewmember under this proposed rule if the person is intermittently assisting the train's movements and traveling in a motor vehicle along a highway near the train. If this proposed rule is finalized, FRA is considering whether to amend the references in the

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[149] 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).
[150] In previous rulemakings, FRA decided that one train crewmember could be both the train's certified locomotive engineer and certified conductor. *See* 49 CFR 240.308(c)(1) and 242.213(d)(1).
[151] 49 CFR 240.308(c)(2) and 242.213(d)(2).
[152] *See* proposed 49 CFR 218.123(d).

locomotive engineer and conductor certification rules that permit the current operation to explain how these provisions are limited. FRA would appreciate comments on this issue.

Additionally, a railroad operation with a train crew that consists of either: (1) a locomotive engineer and conductor; or (2) one crewmember that is dual-certified may have other operating employees identified as train crewmembers. FRA currently defines "train crew" in § 218.5 as one or more railroad employees who are: assigned to a controlling locomotive; called to perform service subject to the Federal hours of service requirements; involved with the movement of the equipment they are called to operate; reporting and working together as a unit that remains in close contact, if more than one employee; and subject to the railroad operating rules and program of operational tests and inspections required in 49 CFR 217.9 and 217.11. Thus, as FRA has an existing definition of the requirements for a train crew, FRA did not propose any new or additional requirements for the train crew in this proposed rule. FRA would appreciate comments on this issue. An alternative option is that FRA require a second crewmember be a conductor, even if the other crewmember is dual-certified, in an effort to ensure a level of teamwork that may not be attainable with any other crewmember. This issue is further explained below for freight and passenger train operations.

1. Freight Train Operations

Regarding the Class I freight railroads, FRA understands that the status of train crew staffing levels has remained unchanged since the Association of American Railroads (AAR) reported to FRA in 2013 after the Lac-Mégantic accident that the Class I railroads were only using two-person crews for over-the-road mainline operations.[153] Because there are no Class I freight railroads currently with a legacy operation and does not expect Class I freight railroads to establish legacy one-person train crew operations

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[153] 81 FR 13937 (citing letter from Mr. Edward R. Hamberger, President and CEO of AAR, to Mr. Joseph C. Szabo, FRA Administrator (Oct. 16, 2013), which was placed in the docket to the 2016 NPRM).

before a final rule in this rulemaking is issued.. FRA expects that, if this proposed rule became a final rule, Class I freight railroads will be required to petition FRA for special approval under proposed § 218.133 to initiate train operations staffed with fewer than two crewmembers.

Meanwhile, fewer freight short line and regional railroads (i.e., Class II and III railroads) are using one-person train crew staffing arrangements than in 2016. In 2016, FRA identified fourteen Class II and III railroads operating single-person train operations,[154] but FRA's analysis in 2021 identified only seven of those same freight railroads maintaining such operations.[155] Also, in the 2016 NPRM, FRA received correspondence from the American Short Line and Regional Railroad Association assuring FRA that its members carefully considered safety concerns when assigning train crew staff. FRA understood this to mean that railroads conducting one-person train crew operations did not implement the operation until a safety analysis was performed.[156] Considering the low number of known short line and regional railroad operations with fewer than two train crewmembers, few Class II and III freight railroads are expected to initiate use of fewer than two train crewmembers in the near future, and the proposed legacy option should permit the continuance of those operations with a good safety record. FRA requests comment on any additional short line and regional freight railroads conducting one-person train crew operations and the interest of railroads to conduct one-person train crew operations in the future.

Freight train operations may currently utilize one crewmember who is dual-certified as both a locomotive engineer and a conductor, along with a second

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[154] 81 FR at 13940.
[155] As of February 4, 2021, FRA identified the following seven railroads as operating with a one-person train crew: (1) Indiana Rail Road; (2) California Northern Railroad Company; (3) Ventura County Railroad Company; (4) Modesto and Empire Traction Company; (5) Pacific Harbor Line Inc.; (6) City of Prineville Railway; and (7) Portland and Western Railroad, Inc.
[156] 81 FR 13937.

crewmember that may be lacking many of the relevant qualifications normally associated with a conductor. In FRA's observations, this is an uncommon occurrence. Rather, it is more common to observe a freight railroad using two dual-certified crewmembers, allowing the crewmembers to take turns operating the locomotive and performing the conductor's duties. However, a freight railroad is currently not prohibited from deploying a dual-certified crewmember with a brakeman, or other operating crewmember as a second crewmember, even though the employee lacks the versatility and training of a conductor, which could raise questions regarding the safety of such a two-person operation. Presumably, a second crewmember who is not a conductor, but is traveling with the train, would handle physical tasks that require a crewmember to dismount from the train, such as throwing a switch, protecting a highway-rail grade crossing, and conducting brake tests. Additionally, a second crewmember who is not a conductor could help identify signal indications and assist the locomotive engineer with radio communications, among other duties. However, a second crewmember who is not a conductor would have fewer responsibilities when compared to a conductor, and the contributing value to the team would likely be less. For example, a second crewmember who is not a conductor would be expected to have training on fewer safety issues compared to a conductor and therefore may not have the knowledge to discuss or resolve as many operational questions as a conductor.

Similar operational concerns could arise with current practices that allow use of a second person who is more like a utility employee[157] 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 performed by a freight conductor if the crew had a second

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[157] 49 CFR 218.5 (defining utility employee as a railroad employee assigned to and functioning as a temporary member of a train or yard crew whose primary function is to assist the train or yard crew in the assembly, disassembly or classification of rail cars, or operation of trains (subject to the conditions set forth in 49 CFR 218.22)).

crewmember who was a freight conductor. However, unlike a crewmember, the utility employee is neither in the locomotive cab with the locomotive engineer nor in near constant radio communication with the locomotive engineer while the train is moving, and therefore cannot replace all the conductor's duties and accompanying safety benefits.

2. Passenger Train Service

Passenger train service means the transportation of persons (other than employees, contractors, or persons riding equipment to observe or monitor railroad operations) by railroad in intercity passenger service or commuter or other short-haul passenger service in a metropolitan or suburban area.[158] For passenger train service, a locomotive engineer is normally located in the locomotive cab, and a passenger conductor, and potentially one or more assistant conductors, normally rides in the passenger cars with the passengers. It is commonplace for train crewmembers to be qualified to perform multiple crewmember jobs so that they are interchangeable, although that is not always the case on each railroad or for each train operation.

Multiple train crewmembers are typically necessary on a passenger train to meet the requirements of FRA's passenger train emergency preparedness rule,[159] which is intended "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."[160] There are numerous ways that passenger train 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

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[158] *See* 49 CFR 239.7 (defining passenger train service).
[159] 49 CFR part 239.
[160] 49 CFR 239.1(a).

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 must be trained on safe methods to assist passengers.

A one-person passenger train crew would have significant difficulty coordinating any type of evacuation, especially in difficult terrain, or if there are large numbers of passengers or other logistical challenges. Furthermore, although posted emergency evacuation signs and instructions for train passengers can be useful, and are indeed required by FRA regulation, the crew's presence is likely to improve instruction to passengers and facilitate situational awareness.

Although passenger train conductors normally do not ride in or next to the locomotive cab with the locomotive engineer for more than a few minutes at a time, passenger train conductors are integral to the train's safe operation. For instance, passenger train conductors assist with train inspection, train makeup, form and record management, troubleshooting, and repair. Passenger train conductors also maintain verbal communication with the locomotive engineer, even though they are often not in the locomotive cab. A well-trained passenger train conductor will recognize passing landmarks and communicate important information by radio to the locomotive engineer.

One safety concern for passenger train crew staffing, similar to the concern expressed above for freight train crew staffing, is that a passenger railroad will use one crewmember who is dual-certified as both a locomotive engineer and a conductor, but the second crewmember is not a certified conductor and may be lacking many of the relevant qualifications normally associated with a passenger train conductor. If a second passenger train crewmember is not a passenger conductor, the second person would have fewer responsibilities when compared to a passenger conductor, and the contributing value to the team would likely be less. As in the freight operations example, a second

crewmember who is not a conductor would be expected to have training on fewer safety issues compared to a conductor and therefore may not have the knowledge to discuss or resolve as many operational questions as a conductor. Consistent with the existing requirements for a "train crew" in § 218.5, a second crewmember on a passenger train, even if not conductor-qualified, must have functions connected with the movement of the train and be called to perform service subject to the Federal hours of service requirements during a tour of duty.[161] FRA is aware of at least two passenger train operations in which the railroads do not use train crewmembers that meet the definition of "train or yard crew" in § 218.5, notably because the second person does not have functions connected with the movement of the train and thus is not performing service subject to the Federal hours of service requirements during a tour of duty.[162] Although such passenger train operations may satisfy the requirements of 49 CFR part 239,[163] railroads would need to seek FRA's special approval under proposed § 218.131 to continue such legacy train operation staffing arrangements.

3. Tourist Train Operations

Currently, the typical train crew staffing arrangement for tourist train operations is like that for passenger train service, with a locomotive engineer located in the locomotive cab and a conductor, and potentially one or more assistant conductors, riding in the passenger cars. The assistant conductors may go by a different title as tourist train operations usually have paid or volunteer train crewmembers that can assist passengers in case of an emergency. Tourist train operations are not required to comply with FRA's

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[161] 49 CFR 218.5 (defining "train or yard crew," in part, by requiring that the crew be called "to perform service covered by Section 2 of the Hours of Service Act.").

[162] As of October 25, 2021, FRA identified the following passenger train operations as operating with a one-person train crew: (1) Denver Regional Transportation District/Denver Transit Operators; and (2) Utah Transit Authority's FrontRunner.

[163] 49 CFR 239.7 (defining "crewmember," in part, to include "a person, other than a passenger, who is assigned to perform . . . [o]n-board functions in a sleeping car or coach assigned to intercity service, other than food, beverage, or security service", and 49 CFR 239.101(a)(2), addressing employee training and qualification of all "on-board personnel," whether in intercity or commuter passenger train service).

passenger train emergency preparedness requirements, whether the operation is on or off the general railroad system.[164] Although FRA is unaware of any tourist train operation on the general railroad system of transportation that operates with a one-person train crew, FRA proposes to include tourist train operations in this rulemaking to ensure tourist trains continue to be appropriately staffed for safety. All tourist operations can likely meet the requirements or exceptions proposed in the rule without altering their operations and, therefore, would not incur any costs.

4. Train Operations in Other Countries

Generally, the data available about one-person train operations in other countries is limited because the information available does not separate one-person crew rail operations from multi-person operations. For this reason, it is difficult to normalize the data and effectively evaluate the safety of foreign, one-person train operations. Canada's train operations are the most comparable foreign operation to those of the U.S. and, as explained in more detail in section III.E above, following the 2013 catastrophic accident in Lac-Mégantic, Canada, Transport Canada issued a temporary directive requiring at least two crewmembers for trains carrying loaded hazardous materials tank cars over main track and sidings. That temporary directive was then replaced with a mandatory operating rule requiring a minimum of two crewmembers for a freight or transfer train carrying one or more loaded tank cars of dangerous goods.

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[164] 49 CFR 239.3(b)(3); 49 U.S.C. 20133(b). The passenger train emergency preparedness requirements in part 239, like those for passenger equipment safety in part 238, arose from a statutory mandate that allowed for different treatment of tourist train operations and followed a series of accidents involving intercity passenger and commuter rail operations. The requirements were therefore structured to apply to intercity passenger and commuter rail operations, not tourist operations. However, FRA noted that the exclusion of tourist operations from those rules was based on incomplete information regarding the unique circumstances of tourist railroads, and that future application of some or all of the emergency preparedness requirements could become appropriate. In such case, FRA would initiate a rulemaking to extend the application of part 239 to tourist operations. *See* 63 FR 24630, 24644 (May 4, 1998). Nor would any such exclusion preclude the application of other rules to tourist operations.

Foreign train operations in developed countries, other than Canada, are not comparable for the most part due to differences in train lengths, territory, and infrastructure. For instance, a foreign, one-person freight train operation in an industrial-type railroad servicing only one origin and one destination would not be comparable due to the complexity of most U.S.-based freight rail operations. Most foreign, one-person freight train operations also do not carry out extensive interlining or switching with other railroads. Further, many foreign, one-person passenger train operations do not have to share track with freight operations or operate over highway-rail grade crossings, and thus the safety hazards associated with those foreign operations are not comparable to those involving U.S. passenger train operations.

To the extent that commenters believe foreign, one-person train operations are relevant, FRA requests that the comments include information and data describing the operations. FRA would also appreciate comments that explain how the foreign operation is comparable to U.S.-based operations and whether the operation would need to file a special approval petition under the rule as proposed if it was U.S.-based, or whether the operation if it was U.S.-based might meet the criteria in one of the exceptions of the proposed rule with or without a change to the proposed requirements.

G. Ensuring Safety in the Future

Since the 2016 NPRM was published, the number of crewmembers on each type of train has largely stayed constant, during a period in which railroad operations have also returned consistent safety statistics. For example, over the five-year period from 2016 to 2020, the average rate of FRA-reportable, human-factor-caused accidents/incidents across industry was 1.05 accidents per million train miles. The lowest rate of 0.95 was in 2016; the highest rate was in 2020 at 1.18 accidents per million train miles. While these consistent safety statistics were attained with the overwhelming majority of train operations using two or more crewmembers, it is unknown how

introducing the additional risk factor of a reduction to a one-person crew will impact safety without conducting or reviewing a risk assessment for the industry or each operation.

The industry's safety record on one-person train crew operations is not well-developed, with few industry participants, and a negligible record of information, which precludes FRA from making meaningful data comparisons of the safety of one-person train crew operations to multiple-person operations. As previously explained above, only a small number of short line and regional railroads, and an even smaller number of passenger train operations, have established one-person train crew operations, and the short line and regional railroads have a dwindling number of such operations, from about fourteen in 2016 to seven in 2021. Consequently, as the number of such operations has dwindled, there is even less data for FRA to consider in establishing the industry's one-person train crew safety record.

Further, those few one-person Class II and III train crew operations are not necessarily indicative of what the safety record might be on the major Class I freight railroads, which tend to operate longer trains, with higher tonnage, for longer distances, and at higher speeds than a short line or regional railroad operation. Train crews on major Class I freight railroads must generally contend with more complexities than typically found on a short line or regional railroad operation, such as more than one type of signal system, more than one set of railroad operating rules and practices that must be followed during the same tour of duty, or higher train traffic density.

For these reasons, FRA proposes to review each railroad's petition for a described operation and to require each railroad that receives FRA's approval to conduct a formal, annual review and analysis of the FRA-approved train operation(s) with fewer than two crewmembers. This will enable FRA to make better safety evaluations and comparisons of operations with fewer than two crewmembers in the future.

H. The Proposal is Complementary to, not Duplicative of, Other Regulatory Initiatives

This proposed rule is complementary 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 by required railroads;[165] railroad safety risk reduction programs;[166] and the development of fatigue risk management programs.[167] Each of these initiatives will enhance safety, and may either aid a railroad in transitioning to an operation with fewer than two crewmembers or assist a railroad in identifying hazards and mitigating risks associated with those hazards once such an operation is established. None of these initiatives nor FRA's regulation on Passenger Train Emergency Preparedness, however, focus exclusively on the specific hazards and risks associated with reducing the number of train crewmembers to fewer than two crewmembers, nor do they necessarily require railroads to mitigate any such hazards and risks. Further, none of these initiatives establish a structure for FRA review of, or allow the public to review, a railroad's plans to reduce crew size or require FRA to approve crew size reductions before they can go into effect.

1. Positive Train Control (PTC) Systems

PTC systems must be designed to prevent the following accidents or incidents: train-to-train collisions, over-speed derailments, incursions into established work zones, and movements of trains through switches left in the wrong position,[168] and therefore the implementation of a PTC system helps improve the safety of rail operations, including

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[165] *See generally* 49 CFR part 236, subpart I; and press release in which FRA announces full implementation of PTCPTC (Dec. 29, 2020), *available at https://railroads.dot.gov/sites/fra.dot.gov/files/2020-12/fra1920.pdf.*

[166] 49 CFR parts 270 and 271.

[167] 85 FR 83484 (Dec. 22, 2020) (proposing to amend 49 CFR parts 270 and 271 to require certain railroads to develop and implement a Fatigue Risk Management Program as one component of the railroads' larger railroad safety risk reduction programs).

[168] *See, e.g.*, 49 U.S.C. 20157(g)(1), (i)(5); 49 CFR 236.1005 (setting forth the technical specifications).

any one-person train operation. However, PTC systems do not completely perform all the job functions of a conductor. 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 how to address a particularly difficult operating problem, or help in diagnosing and responding to train problems and other exceptional situations; (3) 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; (4) assist in flagging highway-rail grade crossings when necessary after PTC slows or stops a train before traversing the crossing or breaking up the train at such crossings to avoid blocking them from highway users for extended periods; (5) update train consist information arising from the set-out and pickup of cars; (6) protect the point, i.e., the leading end of the train movement, during shoving or pushing movements that are not protected by PTC, 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; (7) 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 colliding with on-track equipment and operating through misaligned switches;[169] or (8) assist the train if the PTC system

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[169] Restricted speed is a railroad term that provides a maximum authorized speed for the train, typically 15 or 20 miles per hour, but also requires a train crew to operate at a speed slower than that maximum authorized speed so that the train can be stopped without colliding with on-track equipment or operating through a misaligned switch. Collisions are more likely avoidable if all movements are made at a speed slow enough to stop the movement in half the engineer's range of vision. Restricted speed is often used in yards but may also apply to main track and other types of track where a train may be sharing the track with other locomotive or train movements. If the maximum authorized speed for a restricted speed movement is 15 miles per hour, and the locomotive engineer is operating the train at 10 miles per hour, PTC will not stop that train from colliding with cars left on-track nor will PTC prevent the train from operating through a misaligned switch.

fails en route or enters non-PTC territory. Furthermore, the research suggests that, because 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. Moreover, if the PTC system fails to initialize or fails en route, in certain circumstances, the train may still be operated and in the event a one-person crew was involved, that sole crewmember would not have the benefit of either PTC or a second crewmember.[170] Thus, while PTC is a safety overlay to help prevent certain accidents, FRA's PTC regulations do not include the requirements to perform crewmember job functions, which are essential to prevent or mitigate other accidents.

Likewise, the risk assessment required in FRA's PTC regulatory requirements is different than the risk assessment requirements in this proposed rule and thus would not be duplicative. For instance, FRA requires a railroad to submit a PTC safety plan (PTCSP) and receive PTC System Certification[171] before placing a PTC system into service. Although a PTCSP requires a railroad to develop and submit a hazard log, risk assessment, and hazard mitigation analysis similar to one that would be required in this proposed rule for one-person train crew operations, the subject of the PTC risk assessment is different than for this proposed rule. The PTCSP is required to address all safety-relevant hazards during the life cycle of a PTC system. Meanwhile, this proposed rule would require the development of a hazard log, risk assessment, and hazard mitigation analysis to evaluate and mitigate risks of a one-person train crew. Thus, the proposed rule would not duplicate PTC requirements, as the existing PTC regulations

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[170] *See* 49 U.S.C. 20157(j); 49 CFR 236.567 and 236.1029.
[171] 49 CFR 236.1015.

require a risk assessment of an "as-built PTC system" specifically, whereas the type of risk assessment proposed in this rule for a train operation with fewer than two crewmembers focuses on the entire operation, including the factors proposed under § 218.135, such as the authorized methods of operation; applicable operating rules and practices; hours of operation; qualifications and certifications of crewmembers; number, frequency, and makeup of trains involved; route and terrain over which trains will be operated; number and types of grade crossings; amounts and types of hazardous materials to be transported; and characteristics of the geographic areas through which trains will operate.

2. Railroad Safety Risk Reduction Programs

As codified in 49 CFR parts 270 and 271, FRA requires Class I railroads, railroads with inadequate safety performance, and passenger rail operations to implement railroad safety risk reduction programs. A railroad safety risk reduction program is a comprehensive, system-oriented approach to safety that determines an operation's level of risk by identifying and analyzing identified hazards and developing strategies to mitigate risks associated with those hazards. In this background, FRA is using the term "railroad safety risk reduction programs" to include both a "system safety program" (SSP) that is required for certain passenger rail operations[172] and a "risk reduction program" (RRP) that is required for a limited number of other rail operations.[173]

Although a railroad safety risk reduction program might address a railroad's safety hazards and risks associated with changes in train crew staffing, the framework established by these programs neither directly addresses the risks associated with reducing train crewmembers to fewer than two nor establishes an industry-wide approach.

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[172] 49 CFR 270.3 (requiring the application of the system safety rule to certain passenger rail operations).
[173] 49 CFR 271.3 (requiring the application of the risk reduction program rule to certain rail operations).

First, not every railroad is required to have a railroad safety risk reduction program. Indeed, FRA estimates that fewer than 100 railroads (out of approximately 750 under FRA's jurisdiction) over the next 10 years will be required to develop a railroad safety risk reduction program.

Second, even if a railroad is required to have a railroad safety risk reduction program through which it identifies the risks associated with reducing train crew size to fewer than two crewmembers,[174] the railroad may decide not to implement mitigations to eliminate or reduce those specific risks. Parts 270 and 271 permit railroads to prioritize risks.[175] Whether a railroad that is required to have a program mitigates risks associated with crew staffing will depend on how the railroad prioritizes risks for mitigation and how effectively that mitigation would promote continuous safety improvement compared to mitigation of other identified hazards and risks. Thus, even if train crew staffing is identified as a risk, a railroad may not implement mitigations to eliminate or reduce that risk.

Accordingly, while the safety risk reduction program requirements may complement this proposed rule, they do not address the need for FRA and the railroads to consider and address the safety risks of operations utilizing fewer than two crewmembers across the entire industry.

3. Fatigue Risk Management Programs

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[174] Both the SSP and RRP rules require a railroad to identify and analyze "employee levels" as part of their risk-based hazard management program. 49 CFR 270.103(q)(1) and 271.103(b) introductory text and (b)(1), and 49 U.S.C. 20156. Further, a railroad's obligation to identify and analyze risks associated with reducing train crewmembers to below two would not end after the railroad performs its initial risk-based hazard analysis, as both RRP and SSP are ongoing programs that support continuous safety improvement. 49 CFR 270.103(p)(1)(vii) and 271.101(a). For example, a railroad must periodically assess its SSP or RRP to determine whether the program's goals are being met, and a railroad might identify new hazards and risks as part of this review, including those associated with crew size. 49 CFR 270.303 and 271.401. RRP and SSP also require a railroad to proactively identify hazards and risks associated with a reduction in crew size before making the operational change, in addition to monitoring operational safety following implementation of the new crew size. *See* 49 CFR 270.103(s) and 271.105, and 85 FR 9296.

[175] *See* e.g., 49 CFR 270.5 (definition of "risk-based hazard management") and 271.103(b)(3).

On June 13, 2022, FRA published a final rule adding a Fatigue Risk Management Program (FRMP) to the railroad safety risk reduction program requirements in parts 270 and 271.[176] An FRMP is a comprehensive, system-oriented approach to safety in which a railroad determines its fatigue risk by identifying and analyzing applicable hazards, and developing plans to mitigate, if not eliminate, those risks. Like the railroad safety risk reduction program rules, the final rule is part of FRA's continual efforts to improve rail safety and will satisfy the statutory mandate of Section 103 of the Rail Safety Improvement Act of 2008.[177]

Like the railroad safety risk reduction requirements, there is no guarantee that any railroad covered by the regulation will use an FRMP to address the train crew staffing issue. As with the railroad safety risk reduction program rules, a covered railroad must identify fatigue hazards, assess the risks associated with those fatigue hazards, and prioritize those risks for mitigation purposes. It is possible that other fatigue risks, not associated with a decrease in crew size, might rank higher, in which case the risk associated with a decrease in train crew size might not be promptly mitigated. Further, because the FRMP requirements would apply only to those railroads required to comply with the railroad safety risk reduction program requirements, an FRMP would not be required of every railroad. Thus, like the railroad safety risk reduction program rules, the FRMP final rule is complementary to this proposed train crew size safety requirements rule and is not duplicative.

I. Risk Assessments

Risk, in simple terms, can be thought of as the possibility of something bad happening, and in the context of this rule, the possibility of an unsafe event occurring that results in an accident or incident. Risk also has an element of uncertainty – meaning the

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[176] 85 FR 83484.
[177] Codified at 49 U.S.C. 20156.

probability that the unsafe event will occur and the likelihood of the unsafe event resulting in an accident or incident. A certain amount of risk is inherent in all transportation activities, including railroad operations. Generally, FRA's existing safety regulations address known risks in railroad operations (i.e., risks that have been realized and have resulted in accidents and injuries). Changes to any existing process, operating condition, or even equipment or infrastructure, however, may introduce new risks.

Risks can be systematically reduced by following a risk management process. A risk management process is a formal process used to identify, evaluate, and eliminate or reduce hazards to within a range of acceptability. It is a way to proactively reduce and mitigate risk before an accident, injury, or other catastrophe occurs. FRA's railroad safety risk reduction program rules, discussed above, are examples of the use of risk management tools in FRA's existing rail safety regulatory framework. As also discussed above, however, FRA's railroad safety risk reduction program rules do not specifically mandate that railroads take action to mitigate any resulting risk from those hazards associated with changes in crew staffing levels.

Because, as noted previously, with the exception of certain freight and passenger operations, railroads have historically operated trains with at least two crewmembers, insufficient historical accident and incident data exists to demonstrate the potential impacts of crew size on rail safety generally, and insufficient historical data exists on the impacts of crew size under specific operating scenarios. Accordingly, rather than taking a "wait and see" reactive approach to potential new hazards introduced with changes in crew size, FRA is proposing to require railroads to conduct a risk assessment when seeking to initiate new train operations staffed with fewer than two crewmembers (and railroads seeking to materially modify legacy fewer-than-two-crewmember operations).

A risk assessment is a process of identifying new potential hazards, analyzing what could happen if a particular hazard occurs, estimating the probability of the hazard

occurring as well as the likelihood of the hazard resulting in an accident or incident, and methods to reduce or eliminate the hazard through mitigations (e.g., new or modified processes or equipment). To be effective, risks assessments must be conducted in an objective manner and as a result, standardized risk assessment processes, tools, and other methodologies exist in various industries and contexts.[178]

As noted above, performing risk assessments, risk management, and risk reduction are not new to FRA or the railroad industry. As also noted earlier in this preamble, FRA's RRP and SSP rules, as well as FRA's PTC rule, require railroads to develop and implement processes and procedures that will identify hazards and then mitigate or eliminate the risks that result from those hazards. Similarly, in 2007, FRA published a "Collision Hazard Analysis Guide" (Guide) to assist passenger rail operations in conducting collision hazard assessments.[179] FRA based the Guide on the Department of Defense's Standard Practice for System Safety (MIL-STD-882) and the hazard identification and resolution processes described by the American Public Transportation Association's "Manual for the Development of System Safety Program Plans for Commuter Railroads." The Guide provides a "step-by-step procedure on how to perform hazard analysis and how to develop effective mitigation strategies that will improve passenger rail safety."[180] Although the Guide focuses on passenger rail collisions, the techniques described in the Guide are also valid for evaluating other hazards or safety issues related to any type of operating system.[181]

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[178] *See e.g.*, American Railway Engineering and Maintenance of Way Association (AREMA), Communications and Signal Manual, Volume 4, Section 17 – Quality Principles (AREMA Standard); Department of Defense Standard Practice: System Safety, MIL-STD-882 (May 11, 2012); (DOD Standard) Federal Aviation Administration Order 8040.4B, Safety Risk Management Policy (May 2, 2017).
[179] FRA, U.S. Department of Transportation, Collision Hazard Analysis Guide: Commuter and Intercity Passenger Rail Service (Oct. 2007) (*available at* https://railroads.dot.gov/elibrary/collision-hazard-analysis-guide-commuter-and-intercity-passenger-rail-service).
[180] *Id.* at 5.
[181] *See id*.

Prior to development and publication of the Guide, FRA relied on MIL-STD-882 when promulgating certain aspects of FRA's Passenger Equipment Safety Standards (49 CFR part 238).[182] Part 238 references MIL-STD-882 as a formal safety methodology to identify hazards and then eliminate or reduce the risks associated with each hazard to an acceptable level, when performing required fire safety analyses in procuring new passenger equipment and in planning for the safety of Tier II passenger equipment operations.[183] In addition to MIL-STD-882, FRA has also relied on standards of the American Railway Engineering and Maintenance Association (AREMA) when defining the requirements for abbreviated risk assessments in FRA's Standards for Processor-Based Signal and Train Control Systems and Positive Train Control Systems.[184] Specifically, FRA incorporated AREMA's Communications and Signaling Manual (AREMA Manual), Volume 4, Section 17-Quality Principles. Part 17.3.5 of the AREMA Manual provides a recommended procedure for hazard identification and management for vital electronic/software-based products and systems used in safety-critical systems.[185] Although the AREMA Manual addresses the assessment of risk associated with "products" developed for use in safety-critical systems, the general processes set out in the standard can, like the processes in FRA's Guide, be applied to any type of system (including the system surrounding operating any train with fewer than two person crews).

In the 2005 final rule codifying FRA's Standards for Processor-Based Signal and Train Control Systems, FRA acknowledged that it did not expect the assessment of risks performed under the AREMA standard would prove a product to be "absolutely safe."[186] Instead, FRA indicated that it expected the assessment to provide evidence that the risks associated with the product have been carefully considered and that steps have been taken

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[182] 64 FR 25540 (May 12, 1999).
[183] 49 CFR 238.5, 238.103, 238.603, 64 FR 25540, 25663, 25670, 25696 (May 12, 1999).
[184] *See* 49 CFR part 236, subpart H and I.
[185] 49 CFR 236.909(d).
[186] 70 FR 11052, 11071 (March 7, 2005).

to minimize or mitigate the risks.[187] The same rationale applies to FRA's current proposal. The goal of the risk assessment process is to ensure accepted hazard analysis processes are followed and appropriate mitigation measures are taken to reduce risk to an acceptable level. Generally, an acceptable level of risk is achieved when it is determined that further risk reduction measures will not result in an additional, significant reduction of risk (i.e., when the probability of an unsafe event occurring is small and the likely severity of an accident or incident resulting from that unsafe event is also small). For example, there is a risk that an engineer will allow a train to pass a red signal. The resulting hazard is that the train will collide with another train that is occupying the track past the signal. The probability that this unsafe event will occur is based on an analysis of relevant causal factors (e.g., the potential for an engineer to be distracted or to lose situational awareness). The likelihood of an accident or incident resulting is analyzed based on the probability that another train is occupying the track past the red signal. Potential mitigation may include processes (e.g., the role and tasks of the conductor in calling signals) and equipment and technology (e.g., PTC). In this example, these mitigation measures may not completely eliminate the hazard (i.e., the potential for a collision). However, depending on the operating environment, the risk of the hazard (i.e., a collision) occurring may be reduced to an acceptable level. For example, some signal systems with PTC as an overlay allow for an engineer to pass a red signal to perform certain operations (e.g., switching operations) if appropriate railroad operating procedures are followed. In such situations, the probability of an unsafe event occurring during the switching operation may be small and it may be determined that further mitigation other than operational procedures and equipment alerts would not further reduce the risk.

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[187] *Id.*

As noted above, and in more detail in the section-by-section analysis of proposed § 218.135, standardized risk assessment processes, tools, and methodologies exist not only in FRA's regulations, but in other industries and contexts. In this NPRM, FRA is proposing a process based on these widely accepted existing standards, but tailored to the specific context of this rulemaking.

FRA has proposed specific content and methodology requirements for conducting risk assessments, including defining acceptable and unacceptable levels of risk and allowing for both quantitative and qualitative analyses. FRA intends the specific content and methodology requirements proposed to both ensure that all relevant risks are properly identified, evaluated, and addressed, and to provide railroads clarity and certainty regarding what level of risk FRA proposes as acceptable and what level of risk FRA proposes as not acceptable. Using a standardized risk assessment process as proposed should result in risk assessments being conducted and documented in a consistent manner, enabling railroads to conduct the assessments effectively and efficiently, and at the same time, limit the burden on FRA as it reviews and evaluates every risk assessment filed. Further, as the proposed risk assessment process is consistent with the requirements of other FRA regulations (e.g., FRA's Passenger Equipment Safety Standards, PTC, SSP, RRP), railroads are able to apply the knowledge and skills in preparing risk assessment and hazard analyses for those regulations to the risk assessment process this proposed rule would require.

Although FRA is proposing specific content and methodology requirements for risk assessments, FRA recognizes that every railroad operation is unique and that the technical resources and capabilities of railroads vary. Accordingly, FRA is also providing the flexibility for railroads to use alternative risk assessment methodologies and procedures if those methodologies and procedures provide an accurate assessment of the risk associated with the operation. FRA expects that the flexibility to develop and use

alternative risk assessment methodologies and procedures may be used by some Class I railroads with sophisticated, technical risk management programs. As proposed, any railroad seeking FRA's approval to use such an alternative standard will need to demonstrate to FRA that the methodology and procedures provide at least as accurate an assessment of risk as the specific methodology and processes proposed.

J. Expected Impact on the Safety of Rail Operations and FRA's Proposed Review Standard

FRA expects this proposed rule would ensure that the current industry-wide level of rail safety is not eroded by railroads reducing crew size below two. This rule would require railroads to objectively evaluate and then address safety risks associated with continuing a legacy train operation staffed with one crewmember or initiating a new operation using fewer than two train crewmembers. FRA's proposed petition requirements in §§ 218.131 and 218.133 are intended to solicit enough information for FRA to make an informed decision whether to allow the continuance of a legacy operation or the initiation of a new operation. Without this regulation, railroads would not be required to consult FRA, nor seek FRA approval, to continue or initiate a train operation with fewer than two crewmembers except, to a certain extent, those passenger train operations which require FRA's approval to implement a passenger train emergency preparedness plan under 49 CFR part 239. However, part 239 does not require a railroad to comprehensively consider the safety risks associated with a train operation. Part 239 only requires consideration of the risks and processes involved in responding to emergency situations.

FRA proposes that its decision to grant or deny a petition would be based on whether a railroad submits all required data and information and, as applied to legacy operations, whether that data and information demonstrates that the operation has historically operated consistent with railroad safety, and for proposed new operations,

whether the railroad submits all required data and information, and additionally provides evidence of a properly conducted risk assessment demonstrating that the operation will be operated consistent with railroad safety.

1. Legacy Train Operations

As previously discussed in this background section (III.F.), in 2021, FRA identified seven Class II and III freight railroads with one-person train operations and two one-person passenger train operations. Although FRA expects that the nine operations it identified as current will file for special approval or may otherwise qualify for an exception, it is possible that FRA is unaware of some other railroads that may be using one-person train crews or that some additional railroads may initiate and establish a legacy operation before the final rule's effective date.

FRA expects to approve the continuation of a legacy operation with a one-person train crew if a railroad provides a thorough description of that operation, has sufficiently assessed the risks associated with the operation, and has taken appropriate measures to mitigate or address any risks or safety hazards associated with the operation. In reviewing legacy operations, this rulemaking provides FRA with the opportunity to confirm that each railroad is following an operating model that makes rail safety a priority.

FRA expects that some of these legacy operations do not address every FRA safety concern. For example, in the background section (III.D.2), FRA identified how the adoption of a one-person train crew could degrade safety without considering, for example, how the railroad would monitor the use of prohibited electronic devices, or how operational concerns may arise, such as the loss of a second crewmember's experience during a job briefing. If a railroad does not address those issues, FRA may permit the operation to continue with special conditions that require the railroad to devise strategies to address those safety concerns in a manner that appropriately fits the size and scope of

the operation. FRA requests comment regarding the clarity of the proposed requirements and where FRA should include additional guidance or examples for any of the requirements.

2. Proposed New Fewer Than Two Person Operations

FRA is uncertain about how many petitions for special approval it can expect to receive to initiate a new train operation with fewer than two crewmembers although, for purposes of the Regulatory Impact Analysis, FRA is estimating it will receive two petitions in the first year and that number would increase by 25% per year over the 10-year analysis. The table below shows the estimated number of new operations with fewer than two crewmembers.

Estimated Number of New Operations with Fewer than Two Crewmembers

Year	Number of New One-Person Operations per Year
1	2
2	3
3	4
4	5
5	6
6	8
7	10
8	13
9	16
10	20

There are several reasons for this uncertainty. First, based on FRA's experience, it appears that during the last five years, Class II and III short line and regional freight railroads have reduced the number of one-person legacy operations; however, FRA's information may be incomplete and there may be more operations that FRA does not know about or railroads that are considering initiating such an operation. Second, because collective bargaining agreements typically govern crew size on Class I railroads,

those railroads will need their labor organizations to agree to any reductions in crew sizes through the collective bargaining process before implementation of a new operation with fewer than two crewmembers. Major labor organizations opposed such reductions when they challenged FRA's 2019 Withdrawal. Third, passenger train operations still need to comply with or seek a waiver from FRA's passenger train emergency preparedness requirements in 49 CFR part 239 but may also find alternative methods that are acceptable to FRA. Finally, tourist train operations are the least likely type of operation to embrace fewer than two-person train crews given the nature of their operations.

FRA is proposing in § 218.133 that a railroad seeking to initiate a train operation with fewer than two crewmembers file for FRA's review and approval a petition thoroughly describing the proposed operation, including a risk assessment specific to the proposed operation. As proposed, the risk assessment requirement is designed to ensure railroads conduct a comprehensive, objective assessment of the risks of a planned train operation with fewer than two crewmembers. Although some level of risk is inherent in all transportation activities, risk can be reduced, in some cases to a negligible level, through effective operational practices, technology deployment, and implementation of mitigating measures.

This proposed risk assessment would be considered separate from any railroad safety risk reduction program required under part 270 or 271, and therefore would not be covered by either rule's provision protecting certain information from use in litigation proceedings for damages. Both these provisions apply only to information compiled or collected "solely" for the purpose of either part 270 or 271, and specifically exclude "information that is required to be compiled or collected pursuant to any other provision of law or regulation."[188] Further, FRA's statutory authority for establishing these

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[188] *See* 49 CFR 270.105(a)(2) and 271.11(a)(2).

litigation information protections requires FRA to first conduct a study to determine whether such protections are in the public interest.[189] While FRA issued the litigation information protection provisions in parts 270 and 271 based on such a study, that study did not address whether FRA should extend litigation protections to risk analyses that were not required to be part of a complete railroad safety risk reduction program, such as the risk assessment proposed in this rulemaking.

FRA notes that it has statutory discretion to prohibit public disclosure under the Freedom of Information Act[190] (FOIA) of risk analyses and risk mitigation analyses it obtains, if it determines that the prohibition of public disclosure is necessary to promote public safety.[191] FRA currently does not believe, however, that exercising its discretion in this manner would be consistent with the provisions of this proposed rule that make petitions and the risk analyses they contain available for public comment. Because FRA finds that making the petitions and accompanying risks analyses available for public comment is critical to ensure transparency of the approval process, FRA concludes that protecting them from public disclosure under FOIA is not necessary to promote public safety. FRA nevertheless requests public comment on whether to exercise its discretion to prohibit the public disclosure of the proposed risk assessments under FOIA, as well as alternative options that would allow for some disclosure protection but still allow for meaningful public comment.

As proposed, FRA will evaluate a railroad's risk assessment to determine whether the assessment:

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[189] See 49 U.S.C. 20119.
[190] 5 U.S.C. 552 and *see* 49 CFR part 7 (stating DOT's FOIA regulation).
[191] *See* 49 U.S.C. 20118(c) (stating that "[t]he Secretary may prohibit the public disclosure of risk analyses or risk mitigation analyses that the Secretary has obtained under other provisions of, or regulations or orders under, this chapter if the Secretary determines that the prohibition of public disclosure is necessary to promote railroad safety").

1. Accurately identifies all hazards associated with the proposed operation (or proposed material modification to an existing operation);

2. Appropriately categorizes all identified hazards according to their risks (likelihood and severity); and

3. Identifies and provides for the implementation of appropriate mitigations measures for identified hazards.

As discussed in the Risk Assessment section above, FRA does not expect that a railroad will prove that a proposed operation is absolutely safe. Some level of risk is involved in every transportation operation, and every rail operation, even rail operations with two or more crewmembers that exist today. However, a railroad's risk assessment should provide evidence that risks associated with the proposed operation have been carefully considered and that steps have been taken to eliminate or mitigate those risks, particularly those risks found to have significant potential safety impacts.

As proposed, FRA will approve a petition only if it finds doing so would be consistent with railroad safety. FRA expects to approve a petition if the Associate Administrator for Railroad Safety independently determines that a railroad's safety case establishes that the proposed operation will not result in an unacceptable level of risk. In terms of the proposed risk assessment methodology, FRA will approve a petition if the Associate Administrator independently determines that a railroad's safety case establishes an acceptable level of risk generally or an acceptable level of risk under specific conditions identified.[192] An unacceptable level of risk would be a level of risk that would make the particular operation inconsistent with railroad safety (e.g., a risk that poses catastrophic consequences and is likely to happen on more than an improbable basis or a risk that poses a negligible consequence but is likely to occur frequently). In

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[192] *See* proposed § 218.135(a)(6).

making such a determination, the Associate Administrator will consider all supporting data and information a railroad submits with a petition and the accuracy of a railroad's risk assessment and effectiveness of mitigating actions identified. If FRA identifies inaccuracies in the supporting data or information submitted with a railroad's petition, it will not approve the petition. Similarly, if FRA identifies flaws in the analysis underlying a railroad's risk assessment, FRA will not approve the petition.

FRA acknowledges that the appropriateness of specific mitigating measures will depend on the specific context of individual operations (i.e., what may be an appropriate risk mitigation measure for one railroad's operation, may not be an equally appropriate mitigating measure for another railroad's operation). Accordingly, FRA will evaluate each petition and supporting risk assessment in the context of the specific facts of the proposed operation.

FRA also recognizes that the risk mitigation measures a railroad identifies may not mitigate every identified hazard, but FRA expects the mitigation measures to address the identified hazards with the most significant potential safety impacts to ensure that the overall level of risk of a proposed operation is reduced to an acceptable level. The proposed risk assessment requirement is discussed in more detail in the section-by-section analysis of § 218.135.

FRA anticipates that it would grant petitions that build their risk assessment on accurate information, provide a properly executed risk assessment, and show that hazards not mitigated completely are reasonably determined to be acceptable. FRA anticipates that it would deny a petition if information or data on which a railroad builds its risk assessment is not accurate, the risk assessment is not properly executed, or any partially mitigated or unmitigated hazards are determined (by either the submitting railroad or FRA) to be generally unacceptable or unacceptable under the specific circumstances proposed.

3. Automated Operations

The rail industry is anticipating a future growth in automation and is concerned about how a train crew staffing rule might unnecessarily impede the future of rail innovation and automation. As noted in section III.D above and further explained below, FRA does not expect this rule to impede the future of rail innovation, nor does it expect this rule to allow the rail industry to bypass the existing waiver or other existing regulatory processes that may be necessary for automated operations to be implemented in compliance with FRA's safety regulations.[193]

In March 2018, FRA published a Request for Information (RFI) on the future of automation in the railroad industry.[194] In the RFI, FRA sought information from industry stakeholders, the public, local and State governments, and other interested parties on the extent to which they believe railroad operations can (and should) be automated, as well as the potential benefits, costs, risks, and challenges to achieving such automation. FRA also sought comment on how it could best support the development and implementation of new and emerging automation technologies in railroad operations.

FRA received over 3,000 separate comments in response to the RFI from a wide variety of stakeholders, including: members of the public; railroads; railroad industry suppliers and equipment manufacturers; individual railroad employees; railroad labor organizations; and State and emergency response organizations. The vast majority of public commenters seemed to equate automation in the railroad industry with full automation (i.e., fully autonomous rail operations and the elimination of operating crews). Railroads and industry suppliers, on the other hand, acknowledged that automation is an incremental process already underway. These commenters noted that

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[193] *See* 49 CFR part 211, subparts C and E (providing FRA's rules of practice for waivers and miscellaneous safety-related proceedings and inquiries).
[194] 83 FR 13583 (Mar. 29, 2018), Request for Information: Automation in the Railroad Industry (Docket FRA-2018-0027).

existing technologies (e.g., PTC technology, automated track inspections) are already resulting in increased automated efficiencies and rail safety benefits by reducing the potential for human error, the primary cause of railroad accidents. At the same time, other commenters, including rail labor organizations, urged caution noting infrastructure concerns, the unique operating environment in which U.S. railroads operate, and the importance of not underestimating the value of skilled railroad personnel.

This NPRM proposes a process that would ensure that railroads consider safety and conduct a risk assessment when filing a petition for special approval to initiate a new operation staffed with fewer than two crewmembers or materially modifying an FRA-approved legacy operation, and that FRA will be reviewing and approving those petitions when the criteria are met. Additionally, the petition and requirements proposed concerning annual railroad responsibilities after receipt of special approval would serve to gather data on the relationship between crew size and safety. Thus, FRA expects this proposed rule would help ensure the safe and secure transportation of people and goods without unnecessarily impeding the future of rail innovation and automation.

Regardless of the number of crewmembers a railroad plans to assign to any train operation, a railroad seeking to use rail automation technology that does not comply with FRA's existing rail safety regulations may file a petition for rulemaking under FRA's regulations, or a petition for a waiver of FRA's safety rules. If a railroad seeks to use technology that does not comply with FRA's existing regulations and the railroad seeks to use a fewer than two-person crew for the operation, the railroad could petition FRA for a rulemaking that would revise FRA's regulations to permit the use of the technology as proposed. A rulemaking petition would need to comply with FRA's Rules of Practice (specifically, 49 CFR part 211, subparts A and B) and would have to follow the

Department's regulatory process in compliance with the Administrative Procedure Act.[195] Alternatively, a railroad could petition FRA for a waiver from any applicable regulations as necessary and additionally request that FRA grant a special approval under proposed § 218.133. Similar to a petition for rulemaking, aa waiver petition would also need to comply with FRA's Rules of Practice (specifically, 49 CFR part 211, subparts A and C) and must include all required supporting information, including a safety justification. Although a railroad seeking relief from FRA regulations on both an issue with this proposed regulation and an issue with any other FRA regulation would need to file both a waiver petition and a petition for special approval under proposed § 218.133, that request may be made in a single document with the appropriate supporting information provided. Notably, when granting a waiver, just as contemplated by this proposed rule for special approvals under § 218.133, FRA may impose additional conditions to ensure safety. In conclusion, if rail automation technology does not comply with FRA's existing rail safety regulations, there is no prohibition on a railroad filing a waiver petition along with a petition for special approval under this rule as proposed.

IV. Section-by-Section Analysis

Section 218.5 Definitions

The NPRM proposes to add 11 definitions that will be applicable to all of part 218—Railroad Operating Procedures. Part 218 prescribes minimum requirements for railroad operating rules and practices. As the proposed defined terms are not currently used in the existing requirements, the proposed definitions are not expected to change the meaning of those requirements.

The proposed rule defines the term "Associate Administrator" so that a petition can be directed to the attention of the proper FRA official who will need to review it for

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[195] 5 U.S.C. 551–559.

special approval. A definition of "FTA" is proposed for 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.

FRA proposes to define four terms that relate specifically to the risk assessment content and procedures requirements in proposed § 218.135. These terms are: hazard; mishap; risk; and risk assessment. The meaning of these terms is discussed in more detail in the analysis of § 218.135.

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 regulations.[196] Switching service means the classification of rail cars according to commodity or destination; assembling cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing locomotives and cars for repair or storage; or moving 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.

FRA proposes a definition of "tourist train operation" as a short form of reference to a "tourist, scenic, historic, or excursion train operation." The proposed rule also provides a definition for the phrase "tourist train operation that is not part of the general railroad system of transportation" 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). Any freight, intercity passenger, or commuter passenger railroad operation on the track would make the track part of the general system.[197] In the section-by-section analysis for § 218.127, there is an explanation for

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[196] *See, e.g.*, 49 CFR 229.5, 232.5 and 238.5.
[197] *See* 49 CFR part 209, appendix A.

why FRA is proposing an exception for a tourist train operation that is not part of the general railroad system of transportation.

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 to help define what a work train is in § 218.129(c)(2).

The NPRM proposes a definition of "train" that is consistent with the way FRA has defined the term in other regulations.[198] 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 proposed section. The proposed definition of train is not intended to contain all the exceptions to the crew size and the location of crewmember requirements; instead, those exceptions are found in other sections, clearly identified as exceptions, in the proposed rule text.

Section 218.121 Purpose and Scope

Proposed paragraph (a) states that the purpose of proposed subpart G is to ensure that each train is adequately staffed and has appropriate safeguards in place for safe train operations under all operating conditions. To ensure adequate staffing, the NPRM prescribes minimum requirements for the size of different train crew staffs depending on the type of operation, as described in paragraph (b) of this section.

Proposed paragraph (b) provides that subpart G prescribes minimum requirements for the size of different train crew staffs depending on the type of operation and operating

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[198] *See, e.g.*, 49 CFR 234.5 (defining "train" for grade crossing safety standards), 49 CFR 236.1003 (defining "train" for PTC systems), 49 CFR 238.5 (defining "train" for passenger equipment safety standards), and 49 CFR 241.5 (defining "movement of a train" for extraterritorial dispatching requirements). In each example, a "train" may be made up of one or more locomotives, with or without cars. Wording differences in the definition of "train" between regulations are attributable to the specific structure or application of each regulation.

conditions. 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 operations with fewer than two train crewmembers 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. Proposed paragraph (b) also provides that subpart G prescribes minimum requirements for the location of a second train crewmember on a moving train, and promotes safe and effective teamwork. Moreover, proposed paragraph (b) would expressly allow each railroad to prescribe additional or more stringent requirements in its operating rules, timetables, timetable special instructions, and other instructions.

Section 218.123 General Train Crew Staffing Requirements

Subject to the exceptions in §§ 218.125 through 218.129, this section proposes general crew staffing requirements and explains the circumstances under which a second crewmember may be located outside of the operating cab of the controlling locomotive when the train is moving.

Proposed paragraph (a) requires each railroad to comply with the requirements of subpart G and provides the railroad with the option to adopt its own rules or practices for implementing these requirements. In addition, as proposed in §§ 218.129, 218.131, and 218.133, a railroad would need to adopt its own rules or practices to operate a train with fewer than a two-person crew (e.g., when a mitigating action is required to address an identified hazard or that action is not required by Federal regulation). As proposed in § 218.121, each railroad is free to prescribe additional or more stringent requirements as it sees fit. If a railroad or any other person fails to comply with subpart G, or the railroad's rules or practices used to ensure compliance with the requirements of subpart G, that railroad or other person shall be considered to have violated the requirements of subpart G and may be subject to an FRA enforcement action. Although this would be true even

without this paragraph, FRA intends this paragraph to remind the regulated community that FRA can take enforcement action for noncompliance with either the requirements of subpart G or a railroad's rules implementing subpart G.

Proposed paragraph (b) would require that each train be assigned a minimum of two crewmembers unless an exception is otherwise provided for in subpart G.

Paragraph (c) contains the proposed requirement that, without exception, two crewmembers are always required when a train contains certain quantities and types of hazardous materials that have been determined to pose the highest risk for transportation from both a safety and security perspective. The types and quantities of the hazardous materials identified in paragraph (c) are those that PHMSA, FRA, and TSA, as discussed in section III.E above, have previously determined present heightened safety and security risks in rail transportation. Accordingly, FRA finds that requiring, without exception, a minimum two-person crew to operate such trains is justified.

Proposed paragraph (c)(1) would prohibit the operation of a train with fewer than a two-person crew if the train is transporting certain hazardous materials making it subject to FRA's securement regulation (49 CFR 232.103(n)) if left unattended or if the train is transporting one or more car loads of any hazardous material TSA has designated as RSSM.[199] Paragraph (c)(1) would require a minimum of two crewmembers for any train that contains twenty (20) or more loaded tank cars or loaded intermodal portable tanks of any one or any combination of hazardous materials identified in 49 CFR 232.103(n)(6)(i)(B) (i.e., 20 or more tank car loads or intermodal portable tank loads of any combination of Division 2.1 (flammable gas), Class 3 (flammable or combustible liquid), or Division 1.1 or 1.2 (explosive) hazardous material, or a hazardous substance listed at 49 CFR 173.31(f)(2)).

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[199] See section III.E above for a general discussion of the heightened safety concerns related to the transportation of the identified hazardous materials.

Proposed paragraph (c)(2) would require a minimum of two crewmembers for any train that contains one or more car loads of any material designated as RSSM as defined in 49 CFR 1580.3. Currently, a hazardous material shipment of RSSM can be any one of the following three types of shipments: (1) a rail car containing more than 2,268 kg (5,000 lbs.) of a Division 1.1, 1.2, or 1.3 (explosive) material, as defined in 49 CFR 173.50; (2) a tank car containing a material poisonous by inhalation as defined in 49 CFR 171.8, including anhydrous ammonia, Division 2.3 gases poisonous by inhalation as set forth in 49 CFR 173.115(c), and Division 6.1 liquids meeting the defining criteria in 49 CFR 173.132(a)(1)(iii) and assigned to hazard zone A or hazard zone B in accordance with 49 CFR 173.133(a), excluding residue quantities of these materials; and (3) a rail car containing a highway route-controlled quantity of a Class 7 (radioactive) material, as defined in 49 CFR 173.403.

The general requirement in proposed paragraph (d) is that a crewmember, other than the crewmember operating the train, may be located anywhere outside of the operating cab of the controlling locomotive when the train is moving under certain conditions. The NPRM is written under the premise that the locomotive engineer is the first crewmember, i.e., the crewmember operating the train, and is always located in the cab of the controlling locomotive when the train is moving because that is the only location from which the train can be operated unless the controlling locomotive is being operated remotely—and there is a proposed exception for remote control operations in § 218.129.(c)(3).[200] The second crewmember is typically a conductor, under 49 CFR part 242; however, as the locomotive engineer could be a certified conductor, it is possible that a second, or additional, crewmember could be designated as having a job title other

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[200] This premise is based on the historical understanding that, aside from remote control operations, a train cannot be operated without a locomotive engineer in the cab of the controlling locomotive, because that is where the controls stand is located. *See e.g.*, 49 CFR 229.115 through 229.140, for requirements for locomotive cabs and cab equipment.

than conductor and not require a locomotive engineer or conductor certification.[201] Crewmembers that are not operating the train may also include persons who are training to become certified locomotive engineers or conductors, or other operations employees assigned as crewmembers.

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 is calling signals correctly may reduce the stress level of the engineer. As FRA explained in the background section (III.D.1), it is when employees are under stress and overloaded with tasks, that a one-person crew is more likely to lose situational awareness and make a mistake, i.e., a human-factor failure.

Although for safety purposes the optimal location for crewmembers is usually in the operating cab of the controlling locomotive when the train is moving, FRA recognizes that in certain instances, trains can be operated safely when crewmembers are located elsewhere on the train. For example, FRA is aware that some operations are designed so that a crewmember not operating the train is positioned at the back of the train, which can facilitate train movements that require manually operating switches at the rear of the train. In other operations, railroads may have a crewmember ride in a locomotive that is not the controlling locomotive. This proposed rule does not prohibit crewmembers that

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[201] *See* 49 CFR 240.308 and 242.213.

are not operating the train from safely performing their duties from somewhere else on or near the moving train.

In paragraph (d)(1), it is proposed that the normal location of a crewmember be on the train except when necessary for that crewmember to temporarily disembark. The proposed general requirement is intended to prohibit two-person operations where the second crewmember is either never on the train or spends significant periods of time disassociated from physically being on or near the train. A second assigned crewmember that is regularly in a yard tower, for example, would be violating this proposed general requirement that only permits "temporarily disembarking from the train." The relaxation of the requirement that a crewmember that is not operating the train be on the train is intended to permit only 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 may be moved 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, there may be a train that cannot easily be moved to pick up a conductor that disembarked to throw a switch, and the conductor may be transported in a motor vehicle, or on a following train, several miles away where the conductor can then safely board the assigned train. Conversely, if a railroad's practice is to stop the train after passing more than one possible place 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. Regarding proposed paragraph (d)(1), intercity passenger and commuter operations would not be expected to make changes to an operation with a locomotive engineer at the control stand and a second crewmember that normally travels in any locomotive or car on the moving train, other than when duties, such as switching, require otherwise.

Proposed paragraph (d)(2) contains the requirement that, when a crewmember that is not operating the train is anywhere outside of the operating cab of the controlling locomotive when the train is moving, the crewmember and the locomotive engineer in the cab of the controlling locomotive can directly communicate with each other. 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. 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. Communication must also be two-way, so that the locomotive engineer can initiate direct communication with the other train crewmember(s).

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.

Regarding proposed paragraph (d)(2), intercity passenger and commuter locomotives do not always have room for a crewmember that is not operating the train in

the locomotive control compartment, but a second crewmember may be necessary to assist during 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. Railroads with passenger train operations should look closely at the operating duties that crewmembers, not located in the cab, can perform when any crewmembers can directly communicate with the locomotive engineer in the cab of the controlling locomotive. For example, before leaving each station stop, a passenger 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 are an effective practice by expert teams.

Proposed paragraphs (d)(3) and (4) also contain general requirements that apply when a crewmember that is not operating the train is anywhere outside of the operating cab of the controlling locomotive when the train is moving. The proposed paragraphs require that these crewmembers must be able to continue to perform the duties assigned even when the crewmembers are outside of the operating cab of the controlling locomotive when the train is moving and, under these circumstances, the location of the crewmembers must not violate any Federal railroad safety law, regulation, or order. These proposed general requirements are catch-all provisions intended to ensure that neither a railroad nor a crewmember concludes 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 side of a rail car when protecting a move, or on the ground either throwing switches or inspecting the train.

Finally, under 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 crewmember on a stopped train, as FRA suggests that this is an issue that should be left for each railroad to decide, except to the extent addressed by another regulation—namely, FRA's passenger train emergency preparedness regulation (49 CFR part 239).

Section 218.125 General Exceptions to Train Crew Staffing Requirements

This proposed section is the first of three sections allowing for operational exceptions to the proposed requirement for assigning a minimum of two crewmembers on each train specified in § 218.123(b) and the proposed location requirements for a crewmember that is not operating the train found in § 218.123(d). In the discussion for each proposed paragraph, FRA explains why these proposed exceptions present an acceptable level of risk leading FRA to conclude that, generally, the operations would be consistent with railroad safety. 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 § 218.123(c). This proposed section is intended to cover those general exceptions that apply to freight, passenger, or tourist train operations. FRA requests comments for other similarly situated operations that it should consider excepting and whether a mechanism should be included in the rulemaking to allow future exceptions to be added through a petition process.

In this proposed section, two general exceptions are identified. The exceptions are identified by the shorthand descriptions: (1) helper service and (2) lite locomotive. These shorthand descriptions are used as headings at the beginning of each paragraph.

Paragraph (a) proposes to except trains performing helper service from the proposed two-person crew minimum requirement. 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 so the helper locomotive(s) can provide additional power that will assist the train's locomotive(s) in pushing or pulling it. The proposed paragraph clarifies that helper service includes the time spent traveling to or from a location where assistance is provided. FRA does not believe this type of operation poses a great risk to railroad employees or the general public because 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. As with all these proposed exceptions, a railroad may decide that a certain helper service operation is complex and that more than one crewmember should be assigned to the helper service train.

Proposed paragraph (b) would exempt a lite locomotive or a lite locomotive consist from the two-person crew requirement based on a similar safety rationale as provided for the proposed helper service exception. That is, when a locomotive or a consist of locomotives is not attached to any piece of equipment, or attached only to a caboose, FRA expects that there is less risk to railroad employees and the general public. Lite locomotives are mainly used to move 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 to take more than one locomotive to a repair shop for servicing. The proposed paragraph includes a definition of "lite locomotive" 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 FRA does not intend this exception to cover a passenger train operation containing either single or multiple DMUs or EMUs. FRA has further clarified DMU/EMU exceptions for passenger trains in proposed § 218.127.

Section 218.127 Specific Passenger and Tourist Train Operation Exceptions to Crew Staffing Requirements

This proposed section permits four specific passenger and tourist train operation exceptions to the proposed requirement for assigning a minimum of two crewmembers on each train. FRA expects these proposed exceptions would avoid any potential disruptions in passenger train service and tourist train operations from the proposed rule without a significant effect on safety.

Proposed paragraph (a) excludes a tourist train operation that is not part of the general railroad system of transportation from the proposed two-person crew requirement. In § 218.5, FRA defined "tourist train operation" as a tourist, scenic, historic, or excursion train operation. FRA also defined a "tourist train operation that is not part of the general railroad system of transportation" as a tourist, scenic, historic, or excursion train 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.[202] Because these tourist train operations are off the general system, there is no risk that a train could collide with a train carrying hazardous materials or an intercity or commuter passenger train. Proposed

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[202] 49 CFR part 209, appendix A (describing the extent and exercise of FRA's safety jurisdiction).

paragraph (a) would exclude non-general system tourist train operations from the two-person crew requirement regardless of whether the operations are "insular" or "non-insular." FRA does not exercise jurisdiction over tourist train operations that are off the general system and "insular." A tourist train operation is insular "if its operations are limited to a separate enclave in such a way that there is no reasonable expectation that the safety of any member of the public except a business guest, a licensee of the tourist operation or an affiliated entity, or a trespasser would be affected by the operation."[203] If the tourist train 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 trains operating at slow speeds, thereby reducing the probability of an accident with a motorist or even a serious derailment. FRA exercises jurisdiction over non-insular tourist train operations; however, FRA does not require that all of its safety requirements apply to such operations.[204] Because FRA has a statutory obligation to consider financial, operational, or other factors that may be unique to tourist operations, FRA is careful to consider those factors in determining whether any particular rule will apply to tourist train operations.[205] Over the five-year period from 2016 through 2020, there were four FRA-reportable accidents that non-insular tourist railroads off the general system reported as caused by human factors compared to 16 such accidents by tourist railroad operations on the general system. Thus, FRA is balancing the relevant factors, particularly the financial burden to prevent an FRA-reportable accident that averages less than once per year on all non-insular tourist railroads, in proposing to exclude a tourist train operation that is not part of the general railroad system of transportation from the proposed two-person crew requirement. FRA requests

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[203] *Id*.
[204] *Id*. (describing that FRA's rules that specifically apply beyond the general system to such operations will apply, such as FRA's rules on accident reporting, steam locomotives, and grade crossing signals, as will all of FRA's procedural rules, and the Federal railroad safety statutes themselves).
[205] 49 U.S.C. 20103(f).

comments regarding this proposed exception, and what information, if any, supports that FRA should place greater emphasis on any particular factors.

In paragraph (b), the proposed rule would allow a passenger or tourist train operation with fewer than two crewmembers if the train's cars are empty of passengers and passengers will not board the train's cars until the crew conducts a safety briefing on the safe operation and use of the train's exterior side doors. The proposed exception would not apply just because a passenger or tourist train happens to be empty of passengers, as FRA is proposing a safety briefing requirement, consistent with FRA's passenger equipment safety standards,[206] to help ensure passengers board, and later exit, the train safely. Passenger or tourist trains might need to be moved without passengers for repairs or for the convenience of the railroad, such as to position rolling equipment for future train movements. This exception is proposed because FRA views these movements without passengers as generally not needing a passenger conductor, who would normally ride in a passenger car and not in the locomotive cab. FRA requests comments on this exception, especially if it would require changes to passenger or tourist operations at the point of origin for a train or commenters have information suggesting the exception would be an unsafe practice.

FRA expects that the safety concerns associated with these empty passenger or tourist train operations are lower than for trains loaded with passengers because accidents cannot directly result in injury or fatality of a passenger. Therefore, the proposed rule would allow railroads to determine adequate safeguards to ensure that an empty passenger train operated by a one-person train crew is safe. FRA does not expect this proposed rule to encourage those railroads that operate with a minimum of a two-person crew on empty passenger or tourist trains to take undue risk by taking the second

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[206] *See e.g.*, 49 CFR 238.135(a)(requiring a crew safety briefing prior to a train's departure that identifies each crewmember's responsibilities relating to the safe operation of the train's exterior side doors).

crewmember off this assignment. Instead, FRA is trying to avoid a situation where the proposed rule would require adding a second crewmember who does not perform safety functions. On passenger or tourist 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 until a safety briefing is conducted, a second crewmember is not needed to address any passenger's safety concerns. On the other hand, if passenger or tourist 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.

Proposed paragraph (c) contains an exception to the two-person crew general requirement for a passenger or tourist 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 explained above, a DMU or EMU is a locomotive that is also a car that can transport passengers. These self-propelled cars may be coupled together 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 deciding whether to approve an emergency preparedness plan, FRA would consider the physical characteristics of the territory and how the operation may 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. FRA expects a trained second crewmember would provide valuable assistance in emergency situations where an evacuation could be complicated for passengers. Thus, FRA would likely not approve the emergency preparedness plan, and the exception to the two crewmember rule proposed here would not apply, if the physical characteristics of the territory or the equipment, or both, suggest passengers may not be safely evacuated in an emergency situation under the plan without a second crewmember's assistance.

In the proposed paragraph (c) 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 operations, are not subject to 49 CFR part 239, as the passenger train emergency preparedness regulation excludes "[t]ourist, scenic, historic, or excursion operations, whether on or off the general railroad system."[207] Therefore, general system and non-general system 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 train operations subject to 49 CFR part 239.

Proposed paragraph (d) provides an exception from the two-person crew requirement for a rapid transit operation in an urban area connected with the general

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[207] 49 CFR 239.3(b)(3).

railroad system of transportation under certain conditions. The proposed exception clarifies that a rapid transit operation in an urban area means an urban rapid transit system. For the exception to apply, 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 operation must be temporally separated from any conventional railroad operations, meaning that the rapid transit operation in an urban area is strictly time-separated from conventional operations. The biggest safety concern with 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 would help ensure that the excepted rapid transit operations could not potentially collide with heavier, conventional trains. A temporally separated urban rapid transit operation on the general system is required to obtain an FRA-approved waiver from all applicable FRA regulatory requirements demonstrating an acceptable level of safety, so FRA would have assurances that sufficient measures are in place so the operation can be conducted safely on the general system.[208] The second condition is that there is a Federal Transit Administration (FTA) approved and designated State Safety Oversight (SSO) Agency that is qualified to provide safety oversight, while the third condition is that the operator has an FTA/SSO-approved Public Transportation Agency Safety Plan in accordance with 49 CFR parts 673 and 674. 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

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[208] *See* 49 CFR part 211, appendix A, section V "Waivers That May Be Appropriate For Time-Separated Light Rail Operations".

FTA's jurisdiction. FRA does not want to assert jurisdiction over an operation where FTA is already asserting jurisdiction.

Section 218.129 Specific Freight Train Exceptions to Crew Staffing Requirements

This proposed section provides four exceptions to the minimum two crewmember requirement for freight trains.

Proposed paragraph (a) would exclude certain unit train loading and unloading operations commonly referred to as "mine load-out" or "plant dumping operations." As proposed, this exception would apply to certain low speed, "assembly line" unit train loading or unloading operations that take place on tracks which are temporarily made inaccessible from the general system of transportation during the operation. The loading or unloading for these operations takes place while the train is moving, and FRA proposes to allow the train to operate at no more than 10 mph during the loading or unloading process to qualify for the exception. FRA proposes to require that the track be made inaccessible during these loading or unloading operations, which can be accomplished by placing a derail at a safe distance within the plant, rail yard, customer's facility, or other location where the operation takes place. By making the track temporarily inaccessible, the operation can prevent incursions into the operation area by other rolling equipment, as well as prevent the operated train from unintentionally entering onto the general system. During these types of operations, FRA proposes to prohibit any duties that would require a second crewmember which, for example, would include the operation of hand-operated switches, filling out paperwork, or calling out signal indications; thus, the one-person train crew would not be distracted by these types of additional duties. Further, these loading or unloading operations are normally overseen by a person, either in a tower or on the ground, who can provide oversight into whether the cars are being loaded or unloaded properly, and ensure that the operation is safely progressing. If the operation has such a person providing oversight, the exception

proposes that the person must have the capability of communicating with the locomotive engineer operating the train. FRA could not identify any recent FRA-reportable accidents involving this type of operation where a railroad employee's act or omission was identified as contributing to the cause of the accident. Thus, because these operations occur in a controlled environment, at low speeds, without traditional work for a second crewmember to do, and appear to have a good safety record, FRA proposes that these types of operations be excepted from the proposed two train crewmember requirement.

Proposed paragraph (b) would require that each railroad that implements an operation, described as an exception in paragraph (c) of this section, must have certain operating rules or practices that are consistent with railroad safety. These specific proposed requirements are based on FRA's statement in the background section, explaining that FRA would expect to approve the continuation of a freight operation if it met certain characteristics INRD used to describe its one-person train crew operation. The first of these specific requirements in proposed paragraph (b)(1) is that a one-person train crewmember remain in the locomotive cab during normal operations and may leave the locomotive cab only in case of an emergency affecting railroad operations. A one-person operation is a greater safety risk if the one-person crew will be expected to routinely get off and then climb back on the locomotive. A railroad can arrange for switches to be lined for the one-person train operation and for other operational issues to be handled by other railroad personnel that would simplify the operation for a one-person crew.

Proposed paragraph (b)(2) would require that the railroad have operating rules or practices requiring a one-person train crewmember to contact the dispatcher whenever it can be anticipated that radio communication could be lost, unless the railroad has technology or a protocol established to monitor the train's real-time progress. For

example, based on the railroad's experience, it should be aware of the locations where a train is likely to lose radio communication, such as in a tunnel or in certain mountainous or remote territory. When a one-person train crew conveys the information to the dispatcher, the dispatcher can anticipate the length of the likely communication loss and act accordingly. FRA does not propose that a one-person train crewmember contact the dispatcher for anticipated radio communication losses when technology or other protocols establish a method of monitoring the train's real-time progress. For example, a GPS tracking device on the lead locomotive could be used to monitor the train's real-time progress when communication is lost. FRA also proposes allowing a railroad to establish a protocol that accomplishes real-time monitoring of a one-crewmember train's progress. FRA has not proposed such a requirement for train crews with two or more crewmembers because additional crewmembers could follow emergency protocols in case of incapacitation of another crewmember but, without at least one additional crewmember that is not operating the train, the dispatcher would be the person who would need to recognize that emergency measures are necessary.

Proposed paragraph (b)(3) would require that if the railroad cannot monitor the train's real-time progress, the railroad must have a method of determining the train's approximate location when communication is lost with a one-person crew. In case of an emergency, the railroad should have an established method for narrowing down the approximate location of the train so that it can send emergency responders or operational supervisor observers to monitor the train's progress. As in proposed paragraph (b)(2), the intent is to address incapacitation of a one-person train crew. Although it would be best to always know the exact location of the train, the size and scope of an operation may suggest that knowing the approximate location of the train is consistent with railroad safety.

Knowing the real-time progress of a one-person crewmember operation, or at least its approximate location, is necessary when performing search-and-rescue operations. In proposed paragraph (b)(4), FRA would require that the railroad establish a protocol for determining when search-and-rescue operations must be initiated when all communication is lost with a one-person train crew. FRA is concerned that a one-person train crewmember could be incapacitated without a second train crewmember available to call for emergency first responders. For example, if a one-person crewmember fainted, the alerter would stop the train and there would not be an accident for the public to notice or report. Without a second crewmember or a search-and-rescue initiation protocol, the incapacitated crewmember could be left on the train indefinitely without any emergency medical assistance.

Proposed paragraph (b)(5) would require that a one-person train operation's lead locomotive be equipped with an alerter as defined in 49 CFR 229.5 and that the one-person train crewmember must test that alerter to confirm it is working before departure. Although 49 CFR 229.140 permits some exceptions to the requirement for a working alerter on each locomotive, this NPRM would not permit those exceptions when a railroad is using a one-person freight train crew under this section. Without an alerter on the lead locomotive, a one-person train crew could become incapacitated with the train moving, and the train would continue to operate down the track indefinitely without another crewmember who could apply the emergency brake. In contrast, with an alerter, the train would be stopped with an emergency brake application after a designated period of inactivity.

Proposed paragraph (b)(6) would require that the dispatcher confirm with a one-person train crewmember that the train is stopped before conveying a mandatory directive by radio transmission as required in 49 CFR 220.61. FRA defines a mandatory directive

as "any movement authority or speed restriction that affects a railroad operation."[209] Although 49 CFR 220.61 requires that mandatory directives conveyed by radio not be received and copied by an employee operating the controls of moving equipment, there is no separate requirement for the dispatcher to confirm with a locomotive engineer that a train is stopped. That is because most trains have two or more crewmembers and a conductor could write down the mandatory directive while the locomotive engineer is operating the train. This proposed requirement would further ensure the safety of the conveyance of mandatory directives by radio transmission. In circumstances where the one-person crewmember cannot safely stop the train to copy the mandatory directive, it would be expected that the one-person crewmember and the dispatcher would discuss where or when the train can be safely stopped so that the mandatory directive can be conveyed. A dispatcher could convey important or emergency information to the one-person crewmember by radio outside of the mandatory directive process.

Proposed paragraph (b)(7) would require that a one-person train crewmember will have a working radio on the lead locomotive and a redundant, electronic device appropriate for railroad communications as permitted in 49 CFR part 220, subpart C. FRA does not currently require a working radio in the controlling locomotive of every train,[210] and because a two-person crew has the capability to operate the train with the conductor on another locomotive in the consist, current requirements permit "communications redundancy" by means of a working radio on another locomotive in the consist and do not mandate another means of a working wireless communications device that can be used in the controlling locomotive.[211] As explained in the background section, FRA's requirements for train operations in the event of a communication

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[209] 49 CFR 220.5.
[210] 49 CFR 220.9.
[211] 49 CFR 220.9(a).

equipment failure on the controlling locomotive en route, in 49 CFR 220.38, were written with the expectation that one crewmember can operate the train while a second crewmember communicates with the dispatcher from a second locomotive that has a working radio, but this workaround would not be available to a one-person crew. For this reason, FRA proposes this requirement because it is essential to safety that the one-person crew have a way to communicate with the dispatcher or other railroad personnel without leaving the controlling locomotive. To comply with the proposed requirement, one option is that a railroad-supplied electronic device could be used as a redundant form of communication if the lead locomotive's radio were to fail en route.

Except for trains transporting hazardous materials of the types and quantities described in § 218.123(c), proposed paragraph (c) provides the specific freight train exceptions that would apply to small railroads, work trains, and remote control operations.

Proposed paragraph (c)(1) contains two specific freight train exceptions that would only apply to certain operations of small railroads (i.e., railroads with less than 400,000 annual employee work hours). The first exception would apply to a small railroad operation involving a train no longer than 6,000 feet, operating at a maximum authorized speed of 25 mph, and operating over limited grade. The second exception would apply to a small railroad operation with a maximum authorized speed of 25 mph, but for which a second crewmember, who can directly communicate with the engineer in the cab of the locomotive, is intermittently assisting the train's movements.

FRA is proposing to limit these exceptions to small railroads because the operations of these railroads are generally less complex, and thus pose less risk, as compared to the operations of larger railroads, leading FRA to conclude that the proposed exceptions generally present an acceptable level of risk. For example, small railroads typically have much less dense traffic levels than larger railroads and small railroad

crews generally operate over the same territory day after day on routine schedules. Even slow speed operations on larger railroads do not share these same general operating characteristics (i.e., larger railroads typically have more dense traffic levels, operate longer trains, and use crews that operate over different territories with varying characteristics on a routine basis). Accordingly, a low speed operation on a larger railroad would present a higher level of risk than a low speed operation on a small railroad. Additionally, in limiting these exceptions to small railroads, FRA is providing additional relief to small businesses in the railroad industry, consistent with FRA's Policy Statement Concerning Small Entities in 49 CFR part 209, appendix C.

The first proposed small railroad exception applies to operations that take place at speeds not exceeding 25 mph, over track with less than 1 percent grade over 3 continuous miles or 2 percent grade over 2 continuous miles, and with trains that do not exceed 6,000 feet in length. In FRA's experience, freight railroads with fewer than 400,000 total employee work hours annually 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. Generally, the potential consequences of accidents increase as train speed increases. Most small freight railroads maintain their track to no greater than Class 2 track standards, which allow freight trains to be operated at speeds no greater than 25 mph.[212] As proposed, a small freight railroad that maintains its track to better than Class 2 track standards could file a special approval petition to operate at higher speeds.

As proposed, the exception in § 218.129(c)(1)(i) would apply only to small railroad operations over territory with limited grade. Specifically, FRA proposes to limit the exception to operations over track segments with an average grade of "less than 1

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[212] 49 CFR 213.9.

percent over 3 continuous miles or 2 percent over 2 continuous miles." This proposed grade threshold is consistent with grade limitations in other FRA regulations.[213] Because many small railroad operations are excepted from operating with a two-way end-of-train device,[214] but those devices are essential for the safety of a one-person train operation over territory with a heavy grade to perform brake tests or make an emergency brake application, FRA proposed to limit this exception. FRA requests comments on whether a final rule should include a two-way end-of-train device option for those small railroad operations that operate over heavy grades or whether there is an alternative option to address this safety concern.

A proposed maximum train length requirement is appropriate for this small railroad operation exception to address safety concerns with trains blocking crossings. Again, this would be a minimum requirement, and a small freight railroad could certainly require two or more train crewmembers if the operation's safety would be compromised by using only one person.

Blocked crossings are a safety concern for various reasons, and have recently led Congress to require that FRA establish a blocked crossing portal to collect information, perform outreach to communities, support collaboration in the prevention of incidents at highway-rail grade crossings, and assess the impacts of blocked crossings.[215] Local emergency responders and other highway users can be significantly delayed if a railroad operation with a one-person train crew cannot plan a safe place to stop the train without blocking grade crossings. Planning a safe place to stop the train is typically considered a conductor's job, but with only one crewmember, that one crewmember must decide. If a second train crewmember is available, it is much easier for two crewmembers to separate

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[213] *See e.g.,* 49 CFR 232.407(a)(1) (defining "heavy grade" as related to the requirement for operations to use end-of-train devices) and 49 CFR 240.231(c) (allowing movements over track with limited grade without a pilot in other than joint operations).
[214] 49 CFR 232.407.
[215] The Infrastructure Investment and Jobs Act, Pub. L. 117-58 (Nov. 15, 2021), sec. 22404.

a train and unblock the crossing than leaving that task to a one-person crew. A one-person crew, with no additional railroad personnel to help, would first have to secure the train with hand brakes before attempting to unblock the crossing;[216] and, a failure to properly secure the train could result in a runaway train. For this reason, FRA does not want the additional safety risk of a one-person crew leaving the locomotive cab except in case of an emergency affecting railroad operations, as required in proposed paragraph (b)(1) of this section, and does not consider a blocked crossing to be an emergency under that proposed requirement. The train length requirement is necessary to ensure a train operated under this proposed exception is less likely to block one or more grade crossings in a way that is unduly disruptive to the communities the train passes through. The proposed train length limitation also increases the likelihood the one-person crew could get dispatcher permission to move the train to unblock a crossing, as moving a longer train could be more difficult given the location of other crossings, signals, or other physical or railroad features. This additional requirement should still provide great flexibility to short line railroads because a train that is 6,000 feet would be over a mile long and have approximately 85 to 92 cars.

The second proposed small railroad operation exception applies to small operations of railroads with fewer than 400,000 total annual employee work hours that do not exceed 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 that is working with a locomotive engineer as a unit that remains in close contact. The proposed exception in paragraph (c)(1)(ii) applies when a freight railroad with fewer than 400,000 total employee work hours annually assigns a second crewmember that has the flexibility to travel separately from the train and is assigned to

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[216] 49 CFR 232.103(n).

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 conducting switching service when the train enters a yard or customer's facility. The second train crewmember and the locomotive engineer in the cab of the controlling locomotive must also have a direct way of communicating with each other. Such communication is essential to holding any required job briefings in which train crewmembers 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 at 49 CFR part 220). Direct communication means that the train crewmembers have the capability to communicate with one another without going through an intermediary, such as a dispatcher. With direct communication, either the locomotive engineer or the second crewmember can request assistance from the other crewmember and expect to receive a timely response. As these operations are conducted at relatively low speeds, under conditions where the one-person crew on board the train is intermittently assisted, and when the crewmembers are in direct communication with each other, FRA expects that the second crewmember would play a critical role in improving the safety of the operation, even if the person is not always on board or observing the moving train.

Proposed paragraph (c)(2) would exempt work train operations from the two-person crew requirement. "Work train operations" 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 in 49 CFR 232.407(a)(4), in a regulation requiring end-of-train devices; and, as in that rule, the 4,000 trailing tons or

less threshold is intended to provide operational flexibility for this proposed requirement on railroads, especially smaller railroads.[217] 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 expects 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. However, FRA expects operational complexities to arise with a work train with more than 4,000 trailing tons so that a second crewmember would be extremely beneficial for safety purposes. The proposed exception for work trains engaged in maintenance and repair activities on the railroad includes the time the work train is traveling to or from a work site. FRA seeks comments on the range of safety risks posed by work trains and the 4,000 trailing tons limitation, including the potential cost to railroads.

Proposed paragraph (c)(3) 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

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[217] 62 FR 278, 282 (Jan. 2, 1997).

involved in switching have 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 has a remote control transmitter, and the crewmembers alternate controlling the RCL when the RCL is near 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 RCL operations are best utilized for switching services, a railroad may need to move an RCL from one location to another where the RCL can be more efficiently used. FRA is aware that some railroads 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 with increased complexity beyond the known acceptable limitations previously acknowledged by the industry. For example, the proposed exception in includes the limitations in paragraph (c)(3)(v) that a "train does not contain more than 20 multilevel cars, e.g., autorack cars, regardless of whether they are loaded or empty [and] [a]ny continuous block of more than five multilevel cars must be placed at the rear of the train." The reason for these proposed limitations on RCL operations are that multilevel cars employ cushioning devices that act as shock absorbers to protect the automobiles that are the cargo, especially during switching operations; however, these cushioning devices create challenging train handling characteristics and are not suitable for RCL operations in numbers greater than the proposed limitations. This NPRM reflects limitations, previously discussed in the 2016 NPRM, that reflect guidance accepted by industry stakeholders.[218]

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[218] 81 FR 13947 (docketing US DOT/FRA guidance letters at https://www.regulations.gov/document/FRA-2014-0033-0002).

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 that RCL operations are already restricted to 15 mph,[219] FRA did not anticipate that RCL operations would expand beyond main track terminal operations. While FRA currently does not believe that RCL operations that are so limited need a distance restriction, FRA would appreciate any comments on this issue.

Section 218.131 Continuance of Legacy Train Operations Staffed with a One-Person Train Crew

The purpose of this proposed section is to provide a way for legacy one-person train operations to continue after the effective date of a final train crew size safety requirements rule until FRA can review the safety of the operation. FRA is proposing to define a legacy, one-person operation as one that a railroad established at least two years before the effective date of a final rule on train crew size safety requirements. Without at least two years of one-person train crew operations, a railroad would not have established an accident/incident safety record of a reasonable length on which FRA could base any determination of the level of safety the operation provides. For a railroad to have an operation "established at least two years before," FRA means that during that two-year period, an operation must occur at regular intervals under a set of defined procedures or conditions. FRA understands that a railroad may substitute a multi-person train crew for the one-person operation occasionally but, if the circumstances allow for the one-person operation, the railroad will typically use the one-person train crew. If a railroad did not conduct one-person train crew operations regularly, even when the procedures or conditions were met, the existence of a legacy operation is questionable. FRA expects

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[219] 49 CFR 229.15(a)(14).

that railroads with potential legacy operations will submit comments on their particular factual circumstances so that FRA can consider the impact the proposed rule might have on the regulated community wishing to establish legacy operations. Accordingly, FRA requests comments on this issue.

FRA requests comment on the proposed two-year requirement for establishing a legacy, one-person train operation. FRA recognizes there may be other ways to demonstrate the existence of an established legacy operation such as total number of operating hours or rail miles operated. For example, a railroad that operates a one-person train once per week for two years might have fewer operating hours or rail miles than another railroad that operates a one-person train multiple times per week over a single year. For this reason, railroads with any type of legacy operation are encouraged to comment on the proposed rule and describe whether FRA would need to revise proposed § 218.131 so that the railroad's current operation could be considered a legacy operation. Still another option is that FRA could establish a specific date (e.g., January 1, 2021) by which a fewer than two-person operation must be established to be considered a legacy operation under this rule. FRA also requests comment on other potential criteria that should be required, if any, to establish a legacy operation.

FRA is proposing to prohibit the continuance of legacy one-person freight train operations that transport the hazardous materials of the types and quantities described in § 218.123(c) and, per proposed paragraph (a) of § 218.131, that prohibition would apply as of the effective date of a final rule. Thus, to the extent a legacy one-person freight train operation may continue, it is proposed that it must do so without transporting the hazardous materials of the types and quantities described in § 218.123(c).

Proposed paragraph (a) would prohibit a railroad from continuing a legacy one-person train operation beyond 90 days after the effective date of a final rule if the railroad failed to file a special approval petition containing a description of the operation. Hence,

each railroad that establishes a one-person train operation, for at least two years before the effective date of a final rule, would need to decide whether it wants to continue the operation beyond 90 days after the effective date of a final rule; if it does, the railroad will be required to file a special approval petition, unless the operation is covered under one of the proposed exceptions in § 218.125, § 218.127, or § 218.129. It is proposed in paragraph (a) that legacy train operations that are excepted under §§ 218.125 through 218.129 will be permitted to continue without the need to file a special approval petition. For those legacy, one-person train operations that file a petition for special approval under the proposed rule, the railroad may continue the operation unchanged beyond 90 days after the effective date of a final train crew size safety requirements rule, unless FRA issues a disapproval decision or attaches special conditions to the approval of the petition per § 218.137.

Proposed paragraph (b) contains a list of the minimum information requirements for a railroad's special approval petition requesting continuance of a legacy, one-person train operation. Proposed paragraph (b)(1) requires information about the primary person at the railroad who can be contacted about the petition. The remaining 14 numbered items listed under proposed paragraph (b) are intended to solicit an accurate description of the operation, the hazards present, the mitigating measures taken to improve safety, and the railroad's description of how it determined the operation was safe to implement.

Paragraph (b)(2) proposes a requirement for a railroad that wants to continue a legacy one-person train operation to identify the location of that operation. FRA proposes to require each railroad to provide the location of the legacy operation it wants to continue with as much specificity as can be provided as to industries or communities served, and track segments, territories, divisions, or subdivisions operated over. Although not required, FRA would appreciate receiving documentation describing any prior operations, including their locations, with fewer than two crewmembers that the

railroad may have utilized in the past. For example, documentation could show that a railroad used to run a one-person train operation for 3 days per week for 5 years without incident. That kind of information would show the extent of the operation and the safety record.

In consideration of the proposed location description requirement in paragraph (b)(2), a railroad's request for continuance of a legacy train operation staffed with a one-person train crew must identify the current parameters of the operation's location and should not expand the parameters based on plans for future expansion. A railroad that cannot provide records kept in the normal course of business to support a continuing operation should consider submitting affidavits in support of the existence and extent of the one-person train operation. Lacking a submission containing that type of evidence, the railroad would be relying on FRA to initiate an investigation to confirm the operation's location. If a railroad fails to provide adequate documentation of an operation to be continued, and FRA's investigation does not find adequate support of its existence, the request for continuance will be denied and the railroad will need to file a petition for special approval to initiate a train operation with fewer than two crewmembers per the petition requirements in § 218.133.

Proposed paragraphs (b)(3) through (7) and (10) are sufficiently descriptive that further analysis is unnecessary for those paragraphs. The required information is intended to assist FRA in reviewing the hazards and risk of the operation, in lieu of requiring the railroad to conduct a risk assessment.

Proposed paragraph (b)(8) would require a railroad with a legacy one-person operation to state in its petition for special approval whether the one-person operation hauls hazardous materials of any quantity and type, and the approximate percentage of carload traffic in the one-person operation that is hazardous materials. A one-person operation that does not haul hazardous materials would certainly present less risk than

one that does, all else being equal. Considering other issues related to the operation's size and scope, understanding the quantity and type of hazardous materials hauled will help FRA evaluate the risks of the legacy one-person operation. In the background section, FRA explained that it would expect to approve the continuation of a freight operation if it met certain characteristics INRD used to describe its one-person train crew operation, including that 70 percent or more of the railroad's carload traffic is non-hazardous materials. FRA proposes that a railroad approximate the percentage of carload traffic in the one-person operation that is hazardous materials in its petition as it should be included as a factor in determining the risk posed. FRA does not view 30 percent as the upper limit for hazardous materials carload traffic in a one-person legacy operation, and FRA is not proposing any upper limit. FRA's concern is how to consider the hazards and risk of hazardous materials in the total safety of the operation, which is an issue that can be evaluated with the other proposed requirements for a petition in this section. Further, commenters to a petition for special approval can help illuminate the hazards and risk.

Proposed paragraph (b)(9) is intended to solicit information about whether any limitations are placed on a person operating as a one-person train crew. FRA expects that some railroads will limit a one-person train crew by establishing a maximum number of miles or hours the person may work during a single tour of duty. It is also possible that a railroad operating a legacy operation may have established a fatigue mitigation plan even though there is no current Federal requirement to do so. FRA expects that it would be more likely to grant a petition if a 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 fatigue and sleep disorders. The proposed petition could include an explanation for the rationale

behind the limitation to show that it is part of the railroad's effort to ensure that the train operation would be consistent with railroad safety.

Proposed paragraph (b)(11) would require a detailed description of any technology that is used to perform tasks typically performed by a second crewmember or that prevents or mitigates the consequences of accidents. The technologies described must be already installed and operational, with all FRA approvals as necessary, so that the functionality and impact of the technology on the operation are understood and can be accurately accounted for by FRA in its decision. FRA does not intend this regulation to provide a forum for a railroad to gain approval for use of new technologies that are not already in use. As explained in the background section, railroads that want to use leading-edge rail automation technology should petition for a waiver of FRA's safety rules.

Proposed paragraph (b)(12) would require that each railroad with a legacy one-person operation must already have or add certain rules or practices that apply to the one-person train crew operation, but do not apply to train crew operations with two or more crewmembers. These specific proposed requirements are based on FRA's statement in the background section explaining that FRA would expect to approve the continuation of a freight operation if it met certain characteristics that INRD used to describe its one-person train crew operation. As these requirements are also proposed for the specific freight train exceptions to the two-person crew requirement in § 218.129(b), the section-by-section analysis for that proposed requirement is applicable here and will not be repeated.

Proposed paragraph (b)(13) would require a railroad's petition to include a disabled-train/post-accident protocol that quickly brings railroad employees to the scene of a disabled train or accident unless the railroad is conducting a passenger train operation that is required to comply with the passenger train emergency preparedness

requirements in 49 CFR part 239. In multiple places in the background section, it was explained that without a second crewmember to take mitigation measures, a one-person train crew could be slower to respond to emergencies than a two-person crew but that the railroad could be as effective by implementing a disabled-train/post-accident protocol. FRA does not currently require freight railroads to adopt and comply with a disabled-train/post-accident protocol, although FRA anticipates that some legacy freight operations already maintain the equivalent within their own rules and practices. Thus, for purposes of continuing a legacy one-person freight operation, FRA proposes to require each railroad to submit such a protocol that it has implemented when filing its petition. FRA expects that some railroads already have such a protocol in place and others may need to develop one. Such a proposed protocol must describe the role and responsibilities of the one-person train crewmember and any other railroad employees, including supervisors, with responsibility to address a disabled train or an accident. For instance, some railroads may have operational facilities along the route taken by the one-person freight train operation that employ personnel that can be dispatched to help a disabled train or respond to an accident. Other railroads may have utility workers or other operating employees that travel by motor vehicle to a disabled train to perform operational tasks or mechanical repair work typically performed by a second crewmember. A train may also be considered disabled because the one-person crewmember's hours of service expires, and the railroad then needs to retrieve and replace the crewmember. In this context, FRA expects that an adequate protocol would broadly address any concern that disables a train, whether it be caused by a track washout or other severe weather event, mechanical breakdown, significant operational delay, accident, or other circumstances that prevent the train from moving. Typical operational delays, such as one train waiting in a siding for another to pass, would not be considered a disabled train event. In addition, the proposed protocol must also describe any logistics

and the railroad's expected response times. The reasonableness of the logistics and expected response times of each operation will depend on the scope of the operation and the potential impact on the public.

Proposed paragraph (b)(14) would require a petition for special approval to include five (5) years of accident and incident data for the operation as identified in paragraph (b)(2) of this section, or at least the accident and incident data for the operation from the date the operation was established if the operation was established between 2 to 5 years before the effective date of a final rule. Although FRA requires railroads to report these accidents/incidents under 49 CFR part 225, FRA cannot accurately determine from that reported information which, if any, reportable accidents/incidents are attributable to a railroad's one-person train operation. FRA expects that each railroad will have more information about its own accidents/incidents and can flag the data that applies to the one-person train operation it is petitioning for special approval. The reference in the proposed requirement to paragraph (b)(2) of this section is intended to have the railroad narrow the requested data to the location of the continuing operation that the railroad has identified in its petition. As proposed, FRA does not want to receive accident/incident data unless it pertains to the one-person train operation(s) the railroad's petition is addressing.

Proposed paragraph (b)(15) is a catch-all provision which serves as a reminder to railroads that they may submit any other information describing protections implemented to support the safety of the one-person train operation that the railroad wants to continue after FRA's proposed deadline passes. FRA expects that some railroads would have completed a risk assessment, a safety analysis, or compiled a safety data report before implementing the legacy one-person train operation that the railroad would now want to continue. To the extent that the railroad is willing to share that information with FRA, FRA would like to receive it. Such information would offer assurance that the railroad

carefully considered safety issues before implementation and the availability of such information in the petition is expected to be favorably received.

Proposed paragraph (c) would specify that FRA may request any additional information, beyond what is provided in the petition, that it deems necessary. FRA does not expect to routinely request additional information when a railroad provides the minimum required information listed in paragraph (b). However, FRA may need information clarifying what is provided or FRA may have follow-up questions when the information provided in the petition raises additional safety concerns.

Section 218.133 Special Approval Petition Requirements for Initiation of Train Operations Staffed with Fewer than Two Crewmembers

This proposed section addresses the requirements for initiation of a train operation staffed with fewer than two crewmembers that is not otherwise prohibited or permitted by the other requirements of subpart G. For instance, except for operations permitted under §§ 218.125 through 218.131, proposed paragraph (a)(1) prohibits a railroad from conducting a train operation with fewer than two crewmembers unless it receives special approval under subpart G.

Proposed paragraph (a)(2) addresses the additional general requirements for passenger railroads seeking to begin train operations with fewer than two crewmembers. Because passenger railroads must comply with the existing regulatory requirement to adopt and comply with a written emergency preparedness plan approved by FRA under 49 CFR part 239,[220] proposed paragraph (a)(2) would require that a passenger railroad seeking to begin train operations with fewer than two crewmembers obtain special approval under subpart G and additionally obtain FRA's approval of either: (1) a passenger train emergency preparedness plan under part 239 for the operation; or (2) a

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[220] 49 CFR 239.101.

waiver from the part 239 emergency preparedness plan requirement.[221] If a passenger railroad chooses to request a waiver under 49 CFR part 211, proposed paragraph (a)(2)(ii) allows the railroad to petition for both a waiver under part 211 and special approval under § 218.133 in the same filing. Because the number of crewmembers assigned to a train will affect a railroad's part 239 emergency preparedness plan for that operation, it is appropriate for a passenger railroad to submit one filing that addresses both regulatory requirements.

Proposed paragraph (b) contains the minimum petition requirements for a railroad to request FRA's approval to initiate a train operation with fewer than two crewmembers. FRA expects that a petition meeting these minimum requirements will contain sufficient information for FRA to determine whether the operation is consistent with railroad safety.

Proposed paragraphs (b)(1) through (14) would require essentially the same minimum requirements for a new operation special approval petition as FRA is proposing for a railroad's special approval petition requesting continuance of a legacy one-person freight train operation in § 218.131(b)(1) through (14). The differences between these 14 paragraphs in the new operation and legacy operation proposed petition requirements are contextual in that a new operation cannot be initiated until the railroad has obtained FRA's approval to initiate the operation as proposed, while a railroad petitioning for FRA approval of a legacy operation may continue its operation while FRA is considering its petition. Given these similarities, for more background on proposed paragraphs (b)(1) through (14) of this section, please see the discussion of paragraphs (b)(1) through (14) of proposed § 218.131.

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[221] 49 CFR part 211, subpart C, contains the required processes and procedures for submitting a waiver request to FRA.

The significant difference between the filing requirements for a new operation versus a legacy operation is paragraph (b)(15) of each relevant section. For a legacy operation, proposed paragraph (b)(15) of § 218.131 is a catch-all provision which makes clear that in addition to the information and analysis required by paragraphs (b)(1) through (14) of the section, a railroad may submit any other relevant information to support its petition. For new operations that have not yet been implemented with fewer than two-person crews, FRA proposes a catch-all provision in paragraph (b)(16) of § 218.133, instead, and the additional requirement of a risk assessment for the proposed new operation in paragraph (b)(15). The proposed risk assessment requirement is discussed in detail below in the section-by-section analysis of § 218.135.

Section 218.135 Risk Assessment Content and Procedures

Proposed § 218.135 contains the minimum proposed requirements for a railroad's risk assessment required under subpart G. Generally, the goal of a risk assessment is to assess risk in an objective manner by following a decision-making process designed to systematically identify hazards, assess the degree of risk associated with those hazards, and based on those assessed risks, identify and implement measures to minimize or mitigate the risks to an acceptable level. In the context of this rulemaking, a risk assessment is the process of determining, either quantitatively or qualitatively, the level of risk associated with a proposed train operation staffed with fewer than two crewmembers, including mitigating the risks to an acceptable level. In this NPRM, FRA is proposing a process specific to analyzing the risks of train operations with fewer than two assigned crewmembers. While the proposed process and methodology are taken

from existing standards in transportation and other industries, they are tailored to the specific context of this rulemaking.[222]

FRA is proposing that a railroad's risk assessment be required to identify and account for the risks associated with: (1) the overall operating environment and all operating conditions associated with the proposed operation; and (2) all functions the proposed operation would require to be performed by a crewmember and/or equipment involved in a train's operation that may affect the safety of the operation. As proposed, § 218.135(a) sets the minimum standards for the content and analysis requirements for the required risk assessment. As proposed, however, paragraph (a) would allow a railroad to use alternative risk assessment methodologies and/or procedures if approved by the Associate Administrator.

Specifically, proposed paragraph (a) would require a railroad's risk assessment to contain six elements: (1) a complete description of the proposed operating environment; (2) a list and description of all functions, duties, and tasks associated with the operation of a train as proposed, performed by the crewmember, other railroad employee(s), or equipment, including at a minimum, any function performed; (3) a description of the allocation of all functions, duties, and tasks to the one crewmember, other railroad employee(s), or equipment; (4) a hazard analysis of train operation functions, duties, and tasks; (5) a risk matrix that classifies the severity and likelihood of each partially mitigated or unmitigated hazard; and (6) a risk report of the proposed train operation staffed with fewer than two crewmembers documenting the basis for acceptability of all partially mitigated or unmitigated hazards.

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[222] In the Background section under "Risk Assessments," above, FRA explains that these proposed standards are largely based on standards established by the Department of Defense and AREMA, or FRA in the context of other current rail safety requirements.

Understanding the specific operating conditions under which a train crew with fewer than two crewmembers would be required to operate is critical to identifying potential hazards and the risks associated with those hazards. Accordingly, paragraph (a)(1) requires a complete description of the operating environment, including, at a minimum: all authorized methods of operation;[223] applicable operating rules and practices; hours of operation; qualifications and certifications of the crewmembers; the number and frequency of trains involved; the tonnage, length, and make-up of trains involved; the route and terrain over which the trains will be operated (e.g., maximum grade, sight distances); number and types of grade crossings involved; the amount and types of hazardous materials that would be transported; and the characteristics of the geographic areas through which the trains will operate (e.g., population density, proximity to environmentally sensitive areas). FRA recognizes that every railroad operating environment, and every railroad operation, is unique. Accordingly, in proposed paragraph (a)(1)(xi), individual railroads may need to identify and describe additional aspects of any proposed operation that are relevant to providing a full and complete description of the specific operating environment and conditions of its proposed fewer than two-person train crew operation. As explained below, the risk assessment's hazard analysis will use this information to identify hazards for each operation, under all conditions and operating modes, including when there is a failure of components, equipment, or systems.

Proposed paragraphs (a)(2) and (3) would require a risk assessment to contain a list and description of all functions, duties, and tasks associated with the operation of a train with fewer than two crewmembers that are performed by the one crewmember,

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[223] The phrase "all authorized methods of operation" refers to how a train has authority to move. The following are some of the different methods of operation used by railroads: timetable; mandatory directive; signal indication; or any form of absolute or manual block system.

other railroad employee(s), locomotive equipment or components, or operating and control systems; and identification of the allocation of those functions, duties, and tasks. Just as understanding the specific operating environment in which a fewer than two-person crew would be required to operate is critical to any risk assessment process, identifying the specific functions, duties, and tasks associated with operating in that environment is also critical, as is identifying the "division of labor" in performing those functions, duties, and tasks. Paragraph (a)(2) requires a railroad to identify and describe all functions, duties, and tasks performed by the crewmember, other railroad employee(s), or equipment (e.g., (1) to prepare a train for operation (any pre-departure function); (2) during a train's operation (any en route function); or (3) once a train has stopped moving (whether because the train has reached its destination or stops en route, for any reason). Pre-departure functions would include, at a minimum, inspecting and preparing a train for operation (e.g., obtaining all track bulletins, orders, and manifests; managing the train consist, including train make-up; obtaining and ensuring the accuracy of consist paperwork, including hazardous materials documentation; arming and testing an end-of-train device, as required, and performing necessary brake tests; releasing the handbrakes; and, reviewing, interpreting, or responding to forms, bulletins, or advisories). During a train's operation, the functions would include operating and controlling the train (e.g., applying and releasing of brakes; modulating the throttle; responding to and acknowledging alarms; interacting with non-crewmembers e.g., dispatcher, roadway workers; and, responding to emergencies or unexpected events (e.g., a trespasser on the tracks). Once a train has stopped, the functions would include securing the equipment and communicating with the dispatcher.

Once all functions, duties, and tasks are identified and described under proposed paragraph (a)(2), proposed paragraph (a)(3) would require a railroad to identify the allocation of those functions, duties, and tasks to the crewmember, other railroad

employee(s), or equipment. In other words, "who is responsible for doing what" must be identified. As the allocation of functions, duties, and tasks is completed, and it is confirmed whom or what performs specific functions, duties, or tasks, a railroad must also confirm whether there are additional measures, checks or procedures to confirm that the function, duty, or task is completed and performed correctly. This confirmation, and an understanding of what verification and validations steps are in place, are a critical input to the hazard analysis required by proposed paragraph (a)(4). For example, before a train departs, a single crewmember may be responsible for managing train make-up and obtaining a copy of the train consist and other relevant documentation (e.g., hazardous materials documentation). A railroad may also have in place a process to verify the accuracy of the consist and other documentation by use of automatic equipment identification readers or other technology. While a train is in motion, the single crewmember may be required to operate the train by modulating the throttle and applying the brakes as necessary, but those human actions may be supplemented by computerized control systems (e.g., PTC systems, or systems designed to maximize fuel efficiency by controlling train speed).

Using the information gathered in response to paragraphs (a)(2) and (3), proposed paragraph (a)(4) requires a railroad to complete a hazard analysis of train operating functions, duties, and tasks for operations with fewer than two crewmembers. A "hazard," as defined in § 218.5, is an existing or potential condition that can lead to an unplanned event or series of events (i.e., mishap) that can cause an accident or incident; injury, illness, or death; damage to or loss of a system, equipment, or property; or environmental damage. Identifying relevant hazards and preparing a hazard analysis are fundamental to the process of assessing risk. A hazard analysis is performed to identify potential hazards for purposes of eliminating, or at least mitigating, those hazards. A hazard analysis will assign a qualitative or quantitative severity and probability of

occurrence to any identified hazard causing (or with the potential to cause) an undesirable event. In the context of a risk assessment under this paragraph, a hazard analysis must be designed to reasonably ensure that any hazards associated with any functions, duties, or tasks involved in the train operation are identified, so that suitable mitigating actions can be identified and implemented to ensure the safety of the operation. A hazard analysis must also document what hazards were identified, and the results of an analysis of those hazards (i.e. the extent to which each hazard can be mitigated or eliminated, and any relevant mitigation measures).

As proposed, a hazard analysis must consider the entire state of the proposed fewer than two crewmember operation (i.e., all data and information identified under proposed paragraphs (a)(1) through (3)), and potential failures or malfunctions (including human error and equipment, component, or system failures). Each function, duty, or task potentially represents a hazard, if done incompletely or improperly.

As proposed, paragraph (a)(4) would require a hazard analysis to include four elements: (1) a hazard log, consisting of a comprehensive description of all hazards associated with the proposed train operation; (2) an assessment of each hazard in terms of the severity (i.e., a measure of the worst-credible mishap resulting from the hazard); (3) an assessment of each hazard in terms of probability of occurrence, based on the likelihood of the sequence of events that could lead to the hazardous condition; and (4) a hazard mitigation analysis outlining the sustainable actions and associated components, equipment, systems or processes that are put in place to reduce or eliminate the probability or severity, or both, of each hazard.

A hazard log is a way to track all hazards associated with the operation (e.g., a table). The purpose of a hazard log is to identify associated risks, list mitigations, and document when all required mitigations have been successfully implemented. As proposed in paragraph (a)(4)(i), a hazard log is a mechanism for recording and tracking

all safety relevant hazards (i.e., a log of the potential adverse consequences of what can go wrong when a safety-critical or safety-related function is not completed or completed improperly) when preparing a train for operation, during a train's operation, or once a train has stopped moving. Hazard identification may include fault tree analysis, brainstorming, failure mitigation checklists, or other processes to identify hazards. Expert knowledge, training material, equipment design requirements, and other information can be used to support the preparation of a hazard log.

A hazard log must include sufficient supporting documentation to demonstrate that a robust process was used to identify hazards. A hazard log may include hazard sheets documenting how the hazard was identified, who identified the hazard, the probability and severity of each identified hazard, and how each hazard will be mitigated. If any identified hazard is not fully mitigated, the hazard log must contain documentation demonstrating the partially mitigated or unmitigated hazard remaining and the potential consequences of that remaining hazard.

A hazard log is a living document that must be maintained and updated to reflect the current operating environment. If new hazards are identified, the hazard log must be updated. Similarly, if operational changes are made in a way that introduces additional risk, the hazard log must be updated. Changes to a hazard log must be effectively managed, e.g., through a configuration management process. A configuration management process is the practice of analyzing changes in the operating environment and systematically documenting those changes, and the impact of those changes, on the risk assessment and hazard log. An effective configuration management process must be used to determine when and how often a risk assessment needs to be reviewed and re-validated.

FRA proposes that a railroad identify each hazard in its hazard analysis in terms of both severity and probability. The severity of an identified hazard is a measure of the

hazard's consequences (i.e., an estimation, or potentially a calculation, of a hazard's consequences). As proposed, a hazard's severity is measured as the worst potential credible mishap resulting from the hazard (i.e., the worse-case possible end condition that could result from a hazard). Severity analysis is usually performed qualitatively but may be performed quantitatively with supporting historical data. Proposed paragraph (a)(4)(ii) would require a railroad's hazard analysis to assess and categorize the severity of each identified hazard as follows: (1) catastrophic; (2) critical; (3) marginal; or (4) negligible. These proposed severity categories are derived from the well-established severity categories used in AREMA's Communications and Signaling Manual, but FRA is proposing to define each category in terms of railroad operations and in terms of other FRA regulations. Table 1 in this section proposes to define each severity category as follows:

Catastrophic: A hazard that results in a fatality, irreversible significant environmental damage, or significant monetary loss, and accidents and incidents required to be reported to FRA telephonically under 49 CFR 225.9.

Critical: A hazard that results in a significant injury (as defined in 49 CFR 225.5), reversible significant environmental damage, or reportable monetary loss, and accidents and incidents that are not required to be telephonically reported under 49 CFR 225.9, but are still FRA-reportable under 49 CFR 225.19.

Marginal: A hazard that results in minor injuries (i.e., injuries that are not significant as defined in 49 CFR 225.5), reversible non-significant environmental damage, or monetary loss.

Negligible: A hazard that results in no injuries, no environmental damage, or equipment or railroad structure damages not requiring repair.

FRA requests comments on these proposed categories.

Proposed paragraph (a)(4)(iii) would require the hazard analysis to assess each identified hazard in terms of probability (i.e., the likelihood of occurrence of an event or a sequence of events that could lead to the hazard). A hazard's probability level may be calculated quantitatively (e.g., using failure rates or accident and incident data). Alternatively, a hazard's probability level may be calculated qualitatively (e.g., based on a mix of historical data, equipment reliability data, and expert knowledge). Regardless of how calculated, for purposes of subpart G, a hazard's probability level must be assessed in the context of the probability levels identified in Table 2 of this section. As proposed, the five categories of probability are: (1) frequent; (2) probable; (3) occasional; (4) remote; and (5) improbable. Like the proposed severity categories, these proposed probability categories are derived from the AREMA standard and, in paragraph (a)(4)(iii), FRA is proposing to define each category in terms of railroad operations and in terms of other FRA regulations. Consistent with the AREMA standard, FRA is proposing to allow the categorization of a hazard's probability through either qualitative or quantitative analysis. Qualitatively, in Table 2, FRA proposes to define each probability category (estimated per 1,000 operating hours) as follows:

Frequent: Likely to occur frequently.

Probable: Likely to occur several times.

Occasional: Likely to occur once, but not several times.

Remote: Unlikely, but possible, to occur.

Improbable: So unlikely that it can be assumed occurrence may not be experienced.

Quantitatively, Table 2 proposes to define each probability category in terms of the probability of a hazard occurring per 1,000 operating hours as follows:

Frequent: A hazard having a probability of occurring more often than once every 1,000 operating hours.

Probable: A hazard having a probability of occurring once between every 1,000 operating hours and every 100,000 operating hours.

Occasional: A hazard having a probability of occurring once between every 100,000 operating hours and every 10,000,000 operating hours.

Remote: A hazard having a probability of occurring once between every 10,000,000 operating hours and every 1,000,000,000 operating hours.

Improbable: A hazard having a probability of occurring less than once every 1,000,000,000 operating hours.

A hazard's probability should be based on all relevant information gathered under proposed paragraphs (a)(1) through (3), and the appropriate probability level for any identified hazard is the likelihood of the occurrence of that hazard at any given time.

The assessment of each hazard's severity and probability is essential to any risk assessment, and as proposed, necessary to complete the risk assessment matrix and risk report that paragraphs (a)(5) and (6) would require.

Paragraph (a)(4)(iv) contains the final proposed component of a hazard analysis, a hazard mitigation analysis. As proposed, a railroad's hazard mitigation analysis would be required to identify sustainable mitigating actions and circumstances (e.g., associated components, equipment, systems, or processes) that are put in place to reduce or eliminate the probability or severity of each identified hazard and associated risk. At a minimum, a hazard mitigation analysis must consider the (1) design of the system, equipment and components, including equipment reliability and the necessary functions to be performed, in both a normal operation and in a failed state; and (2) human factors associated with the processes and tasks to be performed, including the required skills and capabilities of staff, the operating environment, and existing or potential impairments. The goal of a hazard mitigation analysis is always to eliminate an identified hazard if

possible. When it is not possible to eliminate a hazard, remaining unmitigated risk must be documented and categorized in terms of severity and probability.

Once a hazard analysis is completed (including implementation and analysis of the effects of all mitigating measures), proposed paragraph (a)(5) requires a risk matrix ranking the severity and likelihood of each hazard that was not eliminated (i.e., each partially mitigated and unmitigated hazard). A risk matrix is a visual representation of the risk analysis and provides a framework to categorize in terms of severity and frequency, each identified hazard that is not fully mitigated by the hazard mitigation analysis. A risk matrix effectively ranks the severity and probability of each hazard; the highest levels of risk are on one end of the matrix, the lowest levels of risk on the other end of the matrix, and the medium risks in the middle of the matrix. Figure 1 below is a graphic representation of the risk matrix concept. Figure 2 below shows a risk matrix as proposed in paragraph (a)(5).

Figure 1: Generic Conceptual Risk Matrix

	SEVERITY			
PROBABILITY	Catastrophic	Critical	Marginal	Negligible
FREQUENT	Very high	Very high	High	High
PROBABLE	Very high	High	High	Medium
OCCASIONAL	Very high	High	Medium	Low
REMOTE	High	Medium	Medium	Low
IMPROBABLE	Medium	Medium	Low	Low

Figure 2: Risk Matrix as Required in Part 218, Subpart G

	SEVERITY			
PROBABILITY	(1) Catastrophic	(2) Critical	(3) Marginal	(4) Negligible
(A) FREQUENT	1A	2A	3A	4A
(B) PROBABLE	1B	2B	3B	4B
(C) OCCASIONAL	1C	2C	3C	4C

(D) REMOTE	1D	2D	3D	4D
(E) IMPROBABLE	1E	2E	3E	4E

Using the severity and probability rankings of one number followed by one letter assigned to each hazard remaining after completion of the hazard mitigation analysis under proposed paragraph (a)(4)(iv) (shown in Figure 2, for example, as 1A, 2B, 3C, 4D), proposed paragraph (a)(5) requires a railroad's risk matrix to categorize the residual risk associated with each hazard into one of 20 different risk categories, ranging from category 1A (a hazard with potential catastrophic consequences likely to occur frequently) to category 4E (an improbable hazard with negligible consequences).

Proposed paragraph (a)(6) requires a risk report documenting the basis for acceptability of all hazards not eliminated through the risk assessment process, i.e., the residual risk associated with the remaining partially mitigated or unmitigated hazards identified in the risk matrix required by paragraph (a)(5). Proposed paragraphs (a)(6)(i) through (iii) specify the three risk categories (unacceptable, acceptable under specific conditions, or acceptable), and place each number/letter ranking of severity/probability into one of those categories as shown in Figure 3 below.

Figure 3: Acceptability/Unacceptability of Residual Risk

Risk Classification	Corresponding Risk Matrix Categories	Description
Unacceptable	1A, 1B, 1C, 1D, 2A, 2B, 2C, 3A, 3B, 4A	The risk is not acceptable.
Acceptable Under Specific Conditions	1E, 2D, 3C, 3D, 4B, 4C	The risk is acceptable under specifically defined conditions, given the scope and extent of the operation and the risk is consistent with railroad safety.
Acceptable	2E, 3E, 4D, 4E	The risk is acceptable.

As proposed, if a hazard cannot be fully mitigated and its matrix categorization falls into the unacceptable category (i.e., categories 1A, 1B, 1C, 1D, 2A, 2B, 2C, 3A, 3B

and 4A), proposed paragraph (a)(6)(i) makes clear that FRA will not approve the operation and that a railroad should not file a petition for special approval with a hazard categorized as "unacceptable" because that level of risk demonstrates that the hazard is too significant and too likely to occur (i.e., too severe and too probable) for FRA to approve the operation. FRA proposes to prohibit operations that identify unacceptable hazards.

Proposed paragraph (a)(6)(ii) provides for the categorization of certain risks as "acceptable under specific conditions" (i.e., categories 1E, 2D, 3C, 3D, 4B, 4C). A railroad may categorize a risk as "acceptable under specific conditions" if its finds that given the scope and extent of the operation (i.e., the specific conditions involved with the operation), accepting the risk is consistent with railroad safety. The railroad's risk report must describe why the railroad finds the conditions acceptable. As proposed, FRA will review a railroad's risk report and the underlying hazard analysis to determine if it agrees accepting the risk is consistent with railroad safety. In doing so, FRA will review the description of each hazard in this category, any mitigating measures implemented, any public comments received, and any other relevant information or data (e.g., FRA's own inspection data or technical staff findings) to determine whether accepting the remaining risk, under the specific conditions proposed by the railroad, is consistent with railroad safety.

The title of the hazard category includes the phrase "under specific conditions" to emphasize that FRA's review will focus on the specific operating conditions identified in a railroad's special approval petition. FRA expects that the risk report and underlying hazardous analysis for any hazard in this category will demonstrate how the specific mitigating measures placed on the operation reduce the identified risk to a level that allowing the operation under the specific conditions proposed is consistent with railroad safety.

FRA recognizes that given every railroad's unique operating environment and the varied size and scope of different railroads' operations, what may be an acceptable risk for one operation, may not be an acceptable risk for another. For this reason, FRA expects the evaluation of hazards identified as "acceptable under specific conditions" to be very fact-based and focused on the specific facts of an operation, as demonstrated by the supporting evidence provided in a railroad's risk report and underlying hazard analysis. For example, if a Class III freight railroad, with limited operations over one track over which no other railroad operates, identifies the grade of that track as a specific hazard, reducing the speed of operations over that track may be an acceptable mitigation measure given the overall size and scope of the operation. However, if a Class I freight railroad with extensive operations over a specific track segment similarly identifies the grade of the track as a hazard and other railroads operate over the same track, reducing the speed of the proposed fewer than two-person operation over that track may not be an acceptable mitigation measure because the additional operations by different railroads over the same track may lead to increased risk given the speed of the other operations, the capacity of the track to handle operations at varying speeds, and potentially the resulting density of operations over the track. FRA would expect that a petitioning railroad with any hazard categorized as "acceptable under specific conditions" would specifically address in its petition how its train operation with fewer than two crewmembers would be consistent with railroad safety. For example, a railroad might emphasize that the operation will have set daily schedules to reduce crewmember fatigue or will arrange to keep the operation's trains moving to reduce blocked crossings in communities passed through.

It is possible that a hazard could properly be determined to be "acceptable under specific conditions" if a railroad adopts one or more safety measures that exceed the minimum Federal rail safety requirements, and the operational or equipment safety

measures adopted are established, proven measures that will reduce the overall severity or probability of risks in the operation generally, even if the additional safety measures do not directly lessen the partially mitigated or unmitigated hazard identified. For example, if a short line freight railroad with a history of low-speed derailments were to invest in track improvements that raised its track class but agreed in its petition that the train operation with fewer than two crewmembers would not operate at the now higher maximum authorized speed allowable, the improvements in track could be considered a specific condition that would offset an identified derailment hazard.

Under the last risk assessment matrix category, proposed paragraph (a)(6)(iii), a hazard that is partially mitigated or unmitigated may simply be acceptable. If it is acceptable, FRA will not deny the petition for special approval if the hazard is appropriately categorized. Thus, the hazards in this category have known and acceptable risks based on their severity and probability. As with any hazard, FRA may determine that the railroad miscategorized the hazard or there was a mistake with the risk assessment's underlying evaluation of the hazard. If a railroad were to categorize a risk as acceptable, but FRA found otherwise, FRA would likely deny the petition or the railroad would need to update the risk assessment before FRA could approve the petition.

Paragraph (b) provides that the Associate Administrator may approve alternative methodologies and/or procedures other than those required by paragraph (a) to assess the risk associated with an operation proposed under subpart G. If, after providing public notice of the request for approval and an opportunity for public comment on the request, the Associate Administrator finds that any such petition demonstrates that the alternative proposed methodology or procedures will provide an accurate assessment of the risk associated with the operation, proposed paragraph (b) provides that the Associate Administrator may approve the use of the proposed alternative(s). As noted earlier, FRA recognizes that standardized risk assessment processes, tools, and methodologies exist in

the transportation industry and other industries. Although in this NPRM, FRA is proposing a process based on these widely accepted existing standards and has tailored the proposed process to the specific context of this rulemaking, FRA recognizes that other industry standards may exist that may be similarly tailored and used to achieve the same goal of this NPRM (i.e., to objectively analyze and effectively mitigate risks of train operations with fewer than two-person crews to an acceptable level). FRA does not intend to preclude the use of such alternative risk assessment standards and paragraph (b) sets forth a process for evaluating any such proposed alternative standards. Recognizing that FRA's approval of an alternative methodology or process of conducting a risk assessment may set the standard for future risk assessments by other parties, it is important to allow for public comment and input on any proposed alternative standard or methodology a party seeks to use. FRA requests comment on this proposal.

As with all aspects of this NPRM, FRA requests comment on the proposal to require risk assessments as part of the petition process for a railroad seeking FRA's approval to initiate a train operation with fewer than two crewmembers. FRA also requests comment on the specific risk assessment process proposed.

Section 218.137 Special Approval Procedure

This section contains the proposed procedure to petition FRA for special approval for both one-person legacy train operations and the initiation of a new operation with fewer than two train crewmembers. Proposed paragraph (a) would require that each railroad submitting a petition to continue a legacy operation or initiate a new operation under proposed §§ 218.131 and 218.133 shall send the petition by email to *FRAOPCERTPROG@dot.gov*. Once FRA receives the petition, FRA will place the petition in a public docket at https://www.regulations.gov.

Proposed paragraphs (b) through (d) would establish a special approval procedure. FRA is proposing to use a process to gather public comment on a petition and

ensure transparency in FRA's evaluation of any petition. FRA proposed a public comment period so that stakeholders, such as the railroad's employees, or businesses and communities adjacent to or served by the railroad, can provide relevant safety information or data. The special approval procedure has been used successfully in other FRA regulations.[224] Proposed paragraph (b) would require that FRA publish a notice in the **Federal Register** concerning each petition it received under this section.

Proposed paragraph (c) would provide a 60-day comment period for each petition. Proposed paragraph (c)(1) contains the minimum requirement that each comment must provide all relevant information and data in support of the commenter's position. As proposed in paragraph (c)(2), comments must be submitted electronically to the assigned docket noted in the applicable **Federal Register** notice.

Proposed paragraph (d) addresses the process for disposition of petitions. For instance, in paragraph (d)(1), FRA proposes that the Administrator may conduct a hearing on a petition using the same procedures the agency uses to conduct other hearings under its rules of practice.

Proposed paragraphs (d)(2) and (3) set the expectation that FRA will normally grant or deny a petition within 120 days of its receipt and a petition must not be implemented until approved. However, should FRA require additional information from the petitioning railroad, or need to investigate issues raised by commenters, a decision on the petition could be delayed. If there is a delay, as proposed, the petition will remain pending until FRA decides it. Further, as proposed in paragraph (d)(2), FRA may attach special conditions as deemed necessary to any approval under this section.

Once approved, a petition does not expire, although FRA provides in proposed paragraph (d)(2) that it may reopen consideration of the petition for cause stated. "For

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[224] *See, e.g.*, 49 CFR 232.17, 238.21, and 238.203.

cause" is a legal term that, in this proposed context, means that FRA will not reopen a petition for consideration unless the agency provides a specific reason, along with all supporting evidence it has as justification for doing so. If FRA were to discover significant safety concerns regarding an approved operation, the discovery could trigger a "for cause" reopening of the petition. In that case, it is proposed in paragraph (d)(4) that FRA would reopen the petition by sending a written notice to the petitioner. In closing any petition reopened for consideration, or granting or denying a petition, FRA proposes to notify petitioners in writing and publish the decision in the docket.

FRA may also reopen consideration of the petition for cause stated by a railroad petitioner. For example, if FRA denies a petition, or grants a petition with special conditions, and the railroad disagrees with FRA's decision, the railroad may ask FRA to reopen consideration of the petition. A request to reopen a denied petition should include an explanation or evidence supporting why FRA's decision should be amended. Meanwhile, a request to reopen a petition that was granted with special conditions should include any challenge to the special conditions, including any alternative conditions the railroad is willing to accept if FRA were to modify the decision in a manner acceptable to the railroad. If a request to reopen the petition is made contemporaneously with FRA's initial decision, FRA is likely to provide notice to the petitioner and interested parties in the same docket rather than publish a new notice in the **Federal Register**.

Proposed paragraph (e) would require a railroad that intends to materially modify an operation that has previously received FRA's special approval under this section to submit a description of how it intends to modify the operation, along with either a new or updated risk assessment accounting for the identified proposed modifications. Proposed paragraphs (e)(1) through (3) describe how FRA defines a material modification in this context. For instance, a modification is material if it is a change to a railroad's operations, infrastructure, or locomotive control or risk mitigation technology, that may

affect the safety of the operation. A modification is also material if the change would affect the assumptions underlying the risk assessment, or the assumptions underlying the risk assessment's risk calculations or mitigations, on which an FRA approval under this section is based. The proposal would require a new or updated risk assessment to meet the requirements of § 218.135 and be submitted to FRA by email at least 60 days before proposing to implement any such modification. Thus, a railroad that wishes to deviate from an FRA-approved petition would 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 approved a one-person operation at a maximum speed of 25 mph and the railroad invested resources to improve the track to support higher operating speeds, 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 are addressed in its risk assessment. FRA is proposing this requirement in lieu of requiring that a new special approval petition be filed for a material modification for an already approved operation. FRA intends the proposed requirement to help streamline the approval process for most routine material modifications. FRA notes, however, that even though a railroad with a legacy operation approved under § 218.131 would not have been required to submit a risk assessment when initially requesting special approval, proposed paragraph (e) would require such a railroad seeking to materially modify that operation to submit a risk assessment. Significant expansions or modifications may be considered a new operation requiring a new submission and opportunity for public comment rather than a material modification. FRA may also consider reopening a petition for consideration after receiving a material modification filing. Further, a material modification must not be implemented until approved.

FRA is mindful the special approval procedures take time and may be a source of uncertainty for railroads wishing to operate with less than two person crews; however, FRA believes the procedures are necessary to ensure those operations are performed safely. FRA would appreciate comment on how to improve the proposed special approval procedures to help reduce uncertainty and ensure timely approval of operations with fewer than two crew members that are determined to be safe.

Section 218.139 Annual Railroad Responsibilities After Receipt of Special Approval

This proposed section would require railroads that receive special approval under either § 218.131 or § 218.133 to conduct a formal, annual review and analysis of the FRA-approved train operation(s) with fewer than two crewmembers and annually provide a report of that reviews' findings and conclusions to FRA. FRA proposes that a railroad receiving special approval under subpart G will be required to complete its formal annual review and analysis no later than March 31 of each year, with the first report being due March 31 of the first year following FRA's approval of the petition. FRA expects that tracking and creating an annual report with this type of information as proposed will help identify trends or problems that are not consistent with railroad safety, but that may be acceptable under specific conditions. FRA would appreciate comments on this proposed requirement, including comments on whether three months will provide sufficient time to produce a report. FRA is also considering an alternative option that would require an annual report deadline depending on when each railroad receives FRA-approval to begin a one-person train operation; e.g., an annual report could be required 15 months after the month in which FRA approved the petition for special approval. FRA is also interested in receiving comments on when the first annual report should be due if a petition is approved with less than six months left in the calendar year; i.e., FRA would want to collect all data for a legacy or newly initiated operation once it is approved, but is willing to consider extending the deadline for producing the first annual report if only a few

months of data would have been collected. There are many ways to address these concerns, and FRA would appreciate comments expressing a preference and a rationale for any option.

Proposed paragraph (b) lists the formal review and analysis requirements that a railroad must include in its annual report for any FRA-approved train operation with fewer than two crewmembers. Each listed safety data item is proposed for inclusion because it will provide insight into the safety of the operation and track meaningful changes. For example, proposed paragraph (b)(1)(i) would require a railroad with an approved petition to provide the total number of FRA-reportable accidents/incidents under part 225 of this chapter. FRA does not want the total to double-count any single incident and therefore included a proposed requirement in paragraph (b)(1)(i) to prevent railroads from making that mistake. Under that same proposed paragraph, FRA would require that the data be subtotaled by whether the accident/incident occurred at a highway-rail grade crossing or not, as well as track the subtotals of accidents/incidents by State and cause separately.

Proposed paragraphs (b)(1)(ii) through (vii), (x), (xiii), and (xiv) concern data of the type that FRA routinely collects and makes available on its safety data and reporting website.[225] Collecting such data as the total number of FRA-reportable employee fatalities as proposed will allow FRA, railroads, and the public to better evaluate the safety of each railroad's operation and compare each operation to the industry at large or other operations.

Proposed paragraphs (b)(1)(viii), (ix), (xi), and (xii) would require a railroad to include in its annual report the total number of certain types of occurrences involving a train with a fewer than two-person crew that would provide additional insight into how

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[225] FRA's Safety Data and Reporting website is found at https://railroads.dot.gov/safety-data.

effective the railroad is in addressing certain types of safety hazards as well as how frequently these problems occur. For instance, proposed paragraph (b)(1)(viii) would require a railroad to report the total number of instances where a railroad employee did not comply with a railroad rule or practice applicable to the FRA-approved train operation(s) with fewer than two crewmembers, but not applicable to train crew operations with two or more crewmembers. FRA would expect that tracking that data would provide insight into the effectiveness of each railroad's rules or practices particular to the one-person train crew operation. The same rationale applies to proposed paragraph (b)(1)(ix) which would require a railroad to report the total number of instances where a person certified as both a locomotive engineer and conductor had a certification revoked for violation of an operating rule or practice that occurred when the person was operating per an FRA-approved train operation with fewer than two crewmembers. If FRA did not specifically propose a requirement for that data, it would be difficult for FRA to ascertain whether locomotive engineers operating as one-person train crews were involved in significant operating rule or practice incidents that require a railroad to revoke the person's certification under FRA's requirements for locomotive engineer certification. Paragraph (b)(1)(xi) follows up on FRA's proposed requirement for railroads with fewer than two crewmembers to have disabled-train/post-accident protocols by requiring that railroads report the total number of instances whereby the railroad was required to implement that protocol. Paragraph (b)(1)(xii) proposes that if there are any instances whereby a dispatcher unexpectedly loses communication with an FRA-approved train operation with fewer than two crewmembers, the railroad must report the total number of those instances. FRA seeks comment on the extent and nature of one-person operations that would have expected losses of communications over their route, and whether FRA should require reporting on any loss of communication, expected or not.

In addition to the proposed requirements for structured data, FRA proposed in paragraph (b)(2) that each instance described in paragraphs (b)(1)(i) through (xii) be sufficiently identified by date and location, and that a description of each event be provided. The proposed requirement for additional details would enable FRA to have greater insight into the types of instances that are occurring on each railroad and whether additional FRA action is warranted. For example, a description of an instance would help understand whether a second-crewmember could have helped prevent the instance or other remedial action would further reduce the risk of a hazard under a risk assessment.

Proposed paragraph (c) would require both legacy railroads and railroads initiating a new operation with fewer than two train crewmembers to include a written confirmation in its annual report to FRA that the operation remains unchanged or, if the operation has changed, a new or updated risk assessment. For new operations that completed a risk assessment, the proposed written confirmation must specify that no calculations or assumptions have changed requiring an updated risk assessment meeting the same requirements as the initially filed risk assessment. For legacy railroad operations that are not required to file a risk assessment with FRA as proposed, FRA proposes that these railroads provide FRA with annual, written confirmation that the operation remains substantially the same as described in the railroad's applicable special approval petition and that no technology changes have been implemented, or new or additional hazards identified. If a legacy railroad's operation has changed, it is proposed that the railroad must prepare and submit a risk assessment – even though a risk assessment would not be initially required for the legacy railroad operation. FRA's rationale for this proposed requirement is that substantial changes to the legacy operation would essentially change the operation to a new operation. FRA's prior approval would have been based on the safety and compliance record of the prior operation, not the new,

substantially changed operation. Thus, a risk assessment is warranted to objectively determine the safety of any new operation.

FRA is interested in any technology changes because analysis may later reveal that the technology added tasks for a one-person train crew and led to a loss of situational awareness, or that the technology added a welcome redundancy. A new risk assessment of a technology would help understand when a change took place and then enable safety comparisons for before and after the technology change is implemented.

Proposed paragraph (c)(1) would require a railroad, with an approved petition, to revise or conduct a new risk assessment to help ensure the railroad is identifying any new hazards, and adjusting the risk calculations of existing hazards that have changed since the railroad's special approval petition was approved. For example, the operation may be serving more customers, and thus doing more switching. Another example of a new hazard or risk adjustment would be that a new customer is shipping hazardous materials of types and quantities not previously transported by the railroad. Still another new hazard or risk adjustment might be the addition of joint operations with another railroad that were not initiated until after FRA granted the railroad's special approval petition. In addition, in paragraph (c)(2), FRA proposed that any new or updated risk assessment submitted in accordance with this paragraph must include a written plan and schedule for implementing any mitigations required to address any newly identified hazards.

In paragraph (d), FRA proposed that it will review and respond to a railroad's annual report submission by September 30 of the year it is submitted. If necessary, FRA's response may include advice or recommendations. If a railroad's annual report submission suggests that the petition does not comply with the requirements of subpart G or that the operation is no longer consistent with railroad safety, FRA may reopen consideration of the petition under § 218.137.

V. Regulatory Impact and Notices

A. Executive Order 12866

This proposed rule is a significant regulatory action within the meaning of Executive Order 12866. Details on the estimated costs of this NPRM can be found in the Regulatory Impact Analysis (RIA), which FRA has prepared and placed in the docket (FRA-2021-0032).

FRA is proposing 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 for those operations that FRA believes do not pose significant safety risks to railroad employees, the general public, or the environment by using fewer than two-person crews.

The proposed rule prescribes minimum requirements for the location of a crewmember that is not operating the train and promotes safe and effective teamwork. In addition, FRA proposes processes to allow railroads to continue operations with one-person train crews, and allow railroads to establish new operations with fewer than two crewmembers when the exceptions do not apply. FRA is not certain about the effect that the proposed rule would have on the total number of operations with crews of fewer than two persons relative to the number that would occur in the baseline without the rule.

The RIA presents estimates of the costs likely to occur over the first 10 years of the proposed rule. The analysis includes estimates of costs associated with special approvals, risk assessments, annual railroad responsibilities after receipt of special approval, and Government administrative costs.

FRA estimated 10-year costs of $2.0 million discounted at 7 percent. The annualized cost would be $0.3 million discounted at 7 percent. The following table shows the estimated 10-year costs of the proposed rule.

Total 10-Year Discounted Costs (2020 Dollars)[226]

Category	Total Cost, 7 Percent ($)	Total Cost, 3 Percent ($)	Annualized Cost, 7 Percent ($)	Annualized Cost, 3 Percent ($)
Special Approval (Legacy Operations)	41,486	41,486	5,907	4,863
Special Approval (New Operations)	318,665	400,442	45,371	46,944
Risk Assessment (Initial and Revisions)	555,124	696,616	79,037	81,665
Risk Assessment - Material Modifications	159,353	197,690	22,688	23,175
Railroad Annual Oversight Responsibilities	127,374	161,450	18,135	18,927
Government Administrative Cost	806,837	1,006,977	114,875	118,048
Total Costs	**2,008,840**	**2,504,662**	**286,014**	**293,623**

While FRA has qualitatively discussed the benefits in the RIA, it does not have sufficient data to monetize those benefits. The primary benefit of this rule is that it would ensure that railroads evaluate and address any potential safety concerns before moving to a train operation with fewer than two crewmembers. The safety of these trains could be eroded if a crew with fewer than two persons operates without accounting for additional risks. The proposed rule would help ensure that train crew staffing does not result in inappropriate or unacceptable levels of safety risks to railroad employees, the public, and the environment.

B. Regulatory Flexibility Act and Executive Order 13272

The Regulatory Flexibility Act of 1980[227] and Executive Order 13272[228] require agency review of proposed and final rules to assess their impacts on small entities. An

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[226] As discussed further in section VI.I. of the RIA, quantified costs do not include costs that could be incurred in order to mitigate risks associated with a reduction in the number of crewmembers.
[227] 5 U.S.C. 601 *et seq*.
[228] 67 FR 53461 (Aug. 16, 2002).

agency must prepare an Initial Regulatory Flexibility Analysis (IRFA) unless it determines and certifies that a rule, if promulgated, would not have a significant economic impact on a substantial number of small entities. FRA has not determined whether this proposed rule would have a significant economic impact on a substantial number of small entities. Therefore, FRA prepared this IRFA to facilitate public comment on the potential small business impacts of the requirements in this NPRM.

FRA invites all interested parties to submit data and information regarding the potential economic impact on small entities that would result from adoption of the proposals in this NPRM. FRA particularly encourages small entities that could potentially be impacted by the proposed amendments to participate in the public comment process. FRA will consider all information and comments received in the public comment process when making a determination of the economic impact on small entities.

1. Reasons for Considering Agency Action

FRA is concerned with the ability of railroads to utilize operations with fewer than two crewmembers without notifying FRA. Railroads may not be considering the adverse safety impact that fewer crewmembers will have. This NPRM would require two crewmembers unless certain exceptions are met. This proposed rule would ensure that railroads examine railroad safety with respect to crew size and work with FRA for special approval for operating trains with fewer than two crewmembers. If FRA did not issue the rule as proposed, railroads would be generally free to operate trains with fewer than two crewmembers, and States could also enforce varying crew size safety requirements.

2. A Succinct Statement of the Objectives of, and the Legal Basis for, the Proposed Rule

This proposed rule would help FRA ensure that safety is not adversely affected when initiating train operations with fewer than two crewmembers. The annual railroad

responsibilities would provide FRA information regarding train operations with fewer than two crewmembers on an annual basis that may be able to improve safety.

FRA is proposing regulations concerning train crew size safety requirements based on the statutory general authority of the 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."[229] The Secretary delegated this authority to the Federal Railroad Administrator.[230]

3. A Description of, and Where Feasible, an Estimate of the Number of Small Entities to Which the Proposed Rule Would Apply

The Regulatory Flexibility Act of 1980 requires a review of proposed and final rules to assess their impact on small entities, unless the Secretary certifies that the rule would not have a significant economic impact on a substantial number of small entities. "Small entity" is defined in 5 U.S.C. 601 as a small business concern that is independently owned and operated and is not dominant in its field of operation. The U.S. Small Business Administration (SBA) has authority to regulate issues related to small businesses, and stipulates in its size standards that a "small entity" in the railroad industry is a for profit "line-haul railroad" that has fewer than 1,500 employees, a "short line railroad" with fewer than 1,500 employees, a "commuter rail system" with annual receipts of less than $16.5 million dollars, or a contractor that performs support activities for railroads with annual receipts of less than $16.5 million.[231]

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[229] 49 U.S.C. 20103.
[230] 49 CFR 1.89(a).
[231] U.S. Small Business Administration, "Table of Small Business Size Standards Matched to North American Industry Classification System Codes, August 19, 2019. https://www.sba.gov/sites/default/files/2019-08/SBA%20Table%20of%20Size%20Standards_Effective%20Aug%2019,%202019.pdf.

Federal agencies may adopt their own size standards for small entities in consultation with SBA and in conjunction with public comment. Under that authority, FRA has published a proposed statement of agency policy that formally establishes "small entities" or "small businesses" as railroads, contractors, and hazardous materials shippers that meet the revenue requirements of a Class III railroad as set forth in 49 CFR part 1201, General Instruction 1-1, which is $20 million or less in inflation-adjusted annual revenues,[232] and commuter railroads or small Governmental jurisdictions that serve populations of 50,000 or less.[233] FRA is using this definition for the proposed rule.

When shaping the proposed rule, FRA considered the impact that the proposed rule would have on small entities. FRA has provided exceptions to the two-person crew requirement which would limit the impact on small entities. In addition, tourist train operations that are not part of the general system may operate with one-person crews.

The proposed rule would be applicable to all railroads, although very few railroads would be affected. FRA estimates there are 744 Class III railroads, of which 704 operate on the general system. These railroads are of varying size, with some belonging to larger holding companies. Currently, nine railroads operate one-person crews; six of which are Class III railroads. Most small railroads would qualify for an exception under section 218.129 which allows for one-person operations if a railroad has under 400,000 employee hours annually and operates less than 25 mph. FRA estimates that 25% of railroads submitting special approval requests each year to initiate operations with fewer than two crewmembers would be Class III railroads.

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[232] The Class III railroad revenue threshold is $39,194,876 or less, for 2018. (The Class II railroad threshold is between $39,194,876 and $489,935,956; and the Class I railroad threshold is $489,935,956 or more.) *See* Surface Transportation Board (STB), available at https://www.stb.gov/econdata.nsf/d03c0c2161a050278525720a0044a825/1acf737531cf98ce8525841e0055e02e.

[233] *See* 68 FR 24891 (May 9, 2003) (codified at Appendix C to 49 CFR part 209).

4. A Description of the Projected Reporting, Recordkeeping, and Other Compliance Requirements of the Rule, Including an Estimate of the Class of Small Entities That Would be Subject to the Requirements and the Type of Professional Skill Necessary for Preparation of the Report or Record

Railroads would be required to submit information to FRA for special approval to operate trains with fewer than two crewmembers. FRA estimates that small railroads would require the same number of hours to complete the special approval request as Class I and Class II railroads. The risk assessment burden may be slightly less than larger railroads, but the average of 120 hours seems to encompass all operations, large and small.

Small railroads would likely have fewer hazards to address as the operation with fewer than two crewmembers may be smaller and less complex than larger railroads' operations. This would ease some of the burden on small railroads and may encourage more short line railroads to initiate train operations with fewer than two crewmembers.

The risk assessment and annual railroad responsibilities would be prepared by a professional or administrative employee. The burdened hourly compensation rate of a railroad employee who performs those duties is $77.44. The special approvals would be prepared by executives, officials, and staff assistants. The hourly compensation rate of a railroad employee who performs those duties is $115.24. The type of professional skills needed by these employees includes the ability to plan and organize work. Such an employee would also need good verbal and written communication skills and attention to detail.

Special Approval (Legacy Operations)

Railroads with one-person train operations that were being conducted at least two years before the effective date of the final rule, and that are not otherwise prohibited from operating one-person operations, may continue those operations by filing a special

approval petition containing a description of the operation. This process is described in § 218.131 of the proposed rule. FRA would review the information provided, and grant or deny approval to operate with fewer than two crewmembers.

FRA is currently aware of nine one-person train crew operations. Six of these railroads are Class III railroads. Each of these railroads would be required to submit information for special approval to continue those operations. Each special approval would require approximately 40 hours of railroad time. The following table shows the costs for special approval for these six existing one-person operations by Class III railroads. The total cost for special approvals for Class III railroads with existing one-person operations would be $27,657. That cost would only be incurred in the first year of the analysis.

Railroad Cost per Special Approval (Legacy Operations), Class III Railroads

Type of Employee	Hours per Special Approval	Hourly Wage Rate ($)	Total Labor Cost per Special Approval ($)	Number of Special Approvals	Total Annual Cost Across Industry ($)
	a	b	c = a * b	d	e = c * d
Senior Manager	14	115.24	1,613		
Superintendent	10	115.24	1,152		
Train Master	8	115.24	922		
Road Foreman	8	115.24	922		
Total	40		4,610	6	**27,657**

Special Approval Process (New Operations)

In order to initiate an operation with fewer than two crewmembers, a railroad must apply for special approval as required by § 218.133. Railroads must submit the appropriate data or analysis so FRA can determine whether the train operation proposed is consistent with railroad safety. New technologies or alternative intervention from railroad employees could be included in the proposed rule to ensure that the operation with fewer than two crewmembers would not negatively impact safety.

Railroads must include a description of a disabled-train/post-accident protocol that quickly brings railroad employees to the scene of a disabled train or accident. Additionally, railroads must submit a copy of any railroad rule or practice that applies to the train operation with fewer than two crewmembers but does not apply to train crew operations with two or more crewmembers. Some railroads may need to modify some rules or practices to tailor them to their fewer than two-person operations. FRA then would grant or deny approval before the operation is implemented. Each special approval for new operations with fewer than two crewmembers would require approximately 48 hours of railroad time.

The estimated cost to railroads for each special approval would be $5,531. The following table shows the costs for special approval for new operations.

Railroad Cost per Special Approval (New Operations), Class III Railroads

Type of Employee	Hours per Special Approval	Hourly Wage Rate ($)	Total Labor Cost per Special Approval ($)
	a	b	c = a * b
Senior Manager	16	115.24	1,844
Superintendent	12	115.24	1,383
Train Master	10	115.24	1,152
Road Foreman	10	115.24	1,152
Total	48		**5,531**

FRA estimates that two new operations would commence in year 1 with fewer than two crewmembers. There would be an estimated 25% annual increase in the number of new operations with fewer than two crewmembers.

FRA estimates that 25% of new operations with fewer than two crewmembers would be on Class III railroads. The following table shows the number of new one-person operations per year.

Estimated Number of New Operations with Fewer than Two Crewmembers

Year	Number of New Operations per Year	Number of New Operations per Year, Class III Railroads
	a	b = a * 0.25
1	2	1
2	3	1
3	4	1
4	5	1
5	6	2
6	8	2
7	10	3
8	13	3
9	16	4
10	20	5

The following table shows the 10-year estimated costs for special approvals for new operations with fewer than two crewmembers, for Class III railroads.

10-Year Costs for Special Approval, New Operations, Class III Railroads

Year	Estimated New One-Person Operations per Year	Total Labor Cost per Special Approval ($)	Total Costs ($)	Present Value 7% ($)	Present Value 3% ($)
	a	**b**	**c = a * b**		
1	1	5,531	5,531	5,531	5,531
2	1	5,531	5,531	5,170	5,370
3	1	5,531	5,531	4,831	5,214
4	1	5,531	5,531	4,515	5,062
5	2	5,531	11,063	8,440	9,829
6	2	5,531	11,063	7,888	9,543
7	3	5,531	16,594	11,057	13,897
8	3	5,531	16,594	10,334	13,493
9	4	5,531	22,126	12,877	17,466
10	5	5,531	27,657	15,044	21,197
Total			**127,222**	**85,687**	**106,603**
Annualized				**12,200**	**12,497**

The cost for special approval for new operations with fewer than two crewmembers would be $127,222 over the 10-year analysis. The discounted value would be $85,687 (PV, 7 percent).

Risk Assessment

As part of the special approval process, railroads initiating new train operations utilizing fewer than two crewmembers would be required to conduct a risk assessment. The risk assessment must include a description of the proposed operation, a hazard analysis, and discussion of the tasks and functions of crewmembers.

Each risk assessment would require an average of 120 hours to complete. If a railroad applies for special approval for more than one train operation, the subsequent requests may take considerably less time than the initial request. This is especially true if the operating characteristics are similar between those operations.

The following table shows the cost for Class III railroads to conduct risk assessments.

Annual Cost for Risk Assessments, Class III Railroads

Type of Employee	Hours per Operation	Hourly Wage Rate ($)	Total Labor Cost per Risk Assessment ($)
	a	b	c = a * b
Professional and Administrative	120	77.44	9,293

Based on the estimated number of new operations with fewer than two crewmembers, the following table shows the 10-year estimated costs for risk assessments for Class III railroads.

10-Year Costs for Risk Assessments, Class III Railroads

Year	Estimated New One-Person Operations per Year	Total Labor Cost per Risk Assessment ($)	Total Costs ($)	Present Value 7% ($)	Present Value 3% ($)
	a	b	c = a * b		

1	1	9,293	9,293	9,293	9,293
2	1	9,293	9,293	8,685	9,022
3	1	9,293	9,293	8,116	8,759
4	1	9,293	9,293	7,585	8,504
5	2	9,293	18,585	14,178	16,513
6	2	9,293	18,585	13,251	16,032
7	3	9,293	27,878	18,576	23,347
8	3	9,293	27,878	17,361	22,667
9	4	9,293	37,170	21,633	29,342
10	5	9,293	46,463	25,273	35,610
Total			**213,728**	**143,951**	**179,087**
Annualized				**20,495**	**20,995**

The cost for risk assessments for new Class III railroad operations with fewer than two crewmembers would be $213,728 over the 10-year analysis. The discounted value would be $143,951 (PV, 7 percent).

Risk Assessment Revisions

If the risk assessment is incomplete or does not address all hazards presented by fewer than two-person operations, FRA may require a railroad to revise their risk assessment. This would happen after FRA has reviewed the initial risk assessment as part of the special approval process.

FRA estimates that one small railroad's risk assessment would require a revision each year. Each revision would require approximately 24 additional hours of labor by the railroad. Once revisions are made, the special approval would once again be reviewed by FRA for a decision to be made.

The estimated cost for each risk assessment revision is shown in the table below.

Cost for Risk Assessment Revisions

Type of Employee	Hours per Operation	Hourly Wage Rate ($)	Total Labor Cost per Revised Risk Assessment ($)
	a	b	c = a * b
Professional and Administrative	24	77.44	1,859

The estimated total 10-year cost for risk assessment revisions for Class III railroads is $1,859. The discounted value is $1,011 (PV, 7 percent). The following table shows the costs for Class III railroads to revise risk assessments.

Annual Railroad Costs for Risk Assessment Revisions, Class III Railroads

Year	Number of Risk Assessments Submitted per Year	Percentage of Risk Assessments Requiring Revisions	Number of Revised Risk Assessments	Cost per Revision ($)	Total Costs ($)	Present Value 7% ($)	Present Value 3% ($)
	a	b	c=a*b	d	e=c*d		
1	1	30%	0	1,859	0	0	0
2	1	30%	0	1,859	0	0	0
3	1	25%	0	1,859	0	0	0
4	1	25%	0	1,859	0	0	0
5	2	20%	0	1,859	0	0	0
6	2	20%	0	1,859	0	0	0
7	3	15%	0	1,859	0	0	0
8	3	15%	0	1,859	0	0	0
9	4	10%	0	1,859	0	0	0
10	5	10%	1	1,859	1,859	1,011	1,424
Total					**1,859**	**1,011**	**1,424**
Annualized						**144**	**167**

Risk Assessment when Material Modification is Made (Legacy Operations)

Legacy one-person operations would need to submit a risk assessment when a material modification is made. FRA estimates that this risk assessment would require approximately 120 hours of labor. Since only nine railroads currently operate trains with one-person crews, FRA estimates that only a small number would be required to perform a risk assessment over the 10-year analysis. Six of the nine railroads are Class III railroads. FRA estimates that one Class III railroad every other year would have a material modification to its operation and require a risk assessment.

The estimated total 10-year cost for risk assessments for Class III railroads would be $46,463. The discounted value would be $33,737 (PV, 7 percent). The following table shows the annual costs for legacy railroads that are performing a risk assessment.

Annual Railroad Costs for Risk Assessments, Class III Legacy Operations

Year	Number of Railroads Submitting Risk Assessment	Hours per Risk Assessment	Hourly Wage Rate ($)	Total Costs ($)	Present Value 7% ($)	Present Value 3% ($)
	a	b	c	d=a*b*c		
1	0	120	77.44	0	0	0
2	1	120	77.44	9,293	8,685	9,022
3	0	120	77.44	0	0	0
4	1	120	77.44	9,293	7,585	8,504
5	0	120	77.44	0	0	0
6	1	120	77.44	9,293	6,625	8,016
7	0	120	77.44	0	0	0
8	1	120	77.44	9,293	5,787	7,556
9	0	120	77.44	0	0	0
10	1	120	77.44	9,293	5,055	7,122
Total				**46,463**	**33,737**	**40,219**
Annualized					**4,803**	**4,715**

Updating Risk Assessment when Material Modification is Made (New Operations)

As part of the proposed rule, railroads must update and resubmit their risk assessment 60 days before a "material modification" is made. A railroad that intends to materially modify an operation with fewer than two crewmembers would be required to submit a description of how it intends to modify the operation and an updated risk assessment accounting for the identified proposed modifications.

FRA estimates that approximately 15 percent of railroads would need to resubmit their risk assessment in any particular year. For these railroads, the burden for updating the risk assessment would be approximately 40 hours.

FRA calculated that the cost for updated risk assessments for new Class III operations with fewer than two crewmembers would be $40,268 over the 10-year analysis. The discounted value would be $25,549 (PV, 7 percent). The following table shows the annual costs for railroads that are resubmitting the risk assessment.

10-Year Costs for Updated Risk Assessments, Class III Railroads

Year	Number of Operations	Number of Updated Risk Assessments	Hours per Risk Assessment	Hourly Wage Rate ($)	Total Costs ($)	Present Value 7% ($)	Present Value 3% ($)
	a	b = a*0.15	c	d	e=b*c*d		
1	1	0	40	77.44	0	0	0
2	2	0	40	77.44	0	0	0
3	3	0	40	77.44	0	0	0
4	4	1	40	77.44	3,098	2,528	2,835
5	6	1	40	77.44	3,098	2,363	2,752
6	8	1	40	77.44	3,098	2,208	2,672
7	11	2	40	77.44	6,195	4,128	5,188
8	14	2	40	77.44	6,195	3,858	5,037
9	18	3	40	77.44	9,293	5,408	7,336
10	23	3	40	77.44	9,293	5,055	7,122
Total					**40,268**	**25,549**	**32,942**
Annualized						**3,638**	**3,862**

Annual Railroad Responsibilities after Receipt of Special Approval

Each railroad that receives special approval for an operation with fewer than two crewmembers would be required to conduct an annual review and analysis, and report to FRA its findings and conclusions no later than March 31 of the following year.

As part of the annual railroad responsibilities in § 218.139, railroads must confirm that the risk assessment, including all calculations and assumptions, remains unchanged. This section also requires railroads to submit information about their specially approved operations collected over the course of the previous year.

The annual burden would be eight hours per train operation. The total estimated cost for annual railroad responsibilities for Class III railroads would be $69,694 over the 10-year analysis. The discounted value would be $46,979 (PV, 7 percent). The table below shows the annual costs for annual railroad responsibilities on Class III railroads.

10-Year Costs for Annual Railroad Responsibilities, Class III Railroads

Year	Number of Reports per Year	Hours per Operation	Hourly Wage Rate ($)	Total Costs ($)	Present Value 7% ($)	Present Value 3% ($)
	a	b	c	d=a*b*c		

1	0	8	77.44	0	0	0
2	7	8	77.44	4,027	3,763	3,909
3	7	8	77.44	4,491	3,923	4,234
4	8	8	77.44	5,111	4,172	4,677
5	10	8	77.44	5,885	4,490	5,229
6	11	8	77.44	6,815	4,859	5,878
7	13	8	77.44	8,054	5,366	6,745
8	16	8	77.44	9,602	5,980	7,808
9	19	8	77.44	11,616	6,760	9,169
10	23	8	77.44	14,094	7,666	10,802
Total				**69,694**	**46,979**	**58,451**
Annualized					**6,689**	**6,852**

Summary of Class III Railroad Costs

The following table shows the annualized cost for Class III railroads that are conducting train operations with fewer than two crewmembers over the 10-year analysis period. The total annualized cost for all class III railroads would be $51,907 (PV, 7 percent).

Total 10-Year Costs, Class III Railroads (Legacy and New Operations)

Cost Category	Annualized Cost, 7 Percent ($)
Special Approval	16,138
Risk Assessment	20,495
Risk Assessment Revisions	144
Risk Assessment - Material Modifications	8,441
Railroad Oversight Responsibilities	6,689
Total Cost for All Class III Railroads	51,907

The industry trade organization representing small railroads, ASLRRA, reports the average freight revenue per Class III railroad is $4.75 million.[234] The following table summarized the average annual costs and revenue for Class III railroads.

Average Class III Railroads' Costs and Revenue

Total Cost for All Class III Railroads, Annualized 7 percent ($)	Number of Class III Railroads	Average Annual Cost per Class III Railroad ($)	Average Class III Revenue ($)	Average Annual Cost as Percent of Revenue
a	b	c = a ÷ b	d	e = c ÷ d
51,907	36	1,442	4,750,000	0.03%

The average annual cost for a Class III railroad that is operating with fewer than two-person crews would be $1,442. This represents a small percentage (0.03%) of the average annual revenue for a Class III railroad.

The estimates above show that the burden on Class III railroads would not be a significant economic burden. FRA requests comments on this estimate and will consider all comments when making a determination for the final rule.

5. Identification, to the Extent Practicable, of All Relevant Federal Rules That May Duplicate, Overlap, or Conflict with the Proposed Rule

FRA is not aware of any relevant Federal rule that duplicates, overlaps with, or conflicts with this NPRM. This proposed rule is complementary 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 positive train control (PTC) systems by required railroads;[235] railroad safety risk reduction programs;[236] and the

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[234] American Short Line and Regional Railroad Association, *Short Line and Regional Railroad Facts and Figures,* p. 10 (2017 pamphlet) (hereinafter *Facts and Figures*).
[235] *See generally* 49 CFR part 236, subpart I; and press release in which FRA announces full implementation of positive train control (Dec. 29, 2020), *available at https://railroads.dot.gov/sites/fra.dot.gov/files/2020-12/fra1920.pdf.*
[236] 49 CFR parts 270 and 271.

development of fatigue risk management programs.[237] Each of these initiatives will enhance safety, and may either aid a railroad in transitioning to an operation with fewer than two crewmembers or assist a railroad in identifying hazards and mitigating risks associated with those hazards once such an operation is established. None of these initiatives, however, focus exclusively on the specific hazards and risks associated with reducing the number of train crewmembers to fewer than two crewmembers, nor do they necessarily require railroads to identify, evaluate, or mitigate any such hazards and risks.

6. A Description of Significant Alternatives to the Rule

This analysis considered two alternatives to the rule: the baseline approach, and a waiver process for FRA-approval of trains operating with fewer than two crewmembers. The baseline alternative (no action) would not ensure that safety is being considered by railroads when reducing crew size. There are many benefits to having two crewmembers in the locomotive. Without this rule, railroad operations may be less safe if railroads do not provide alternate measures to ensure safety is not eroded when reducing the number of crewmembers to fewer than two people.

A waiver process alternative requires a railroad seeking FRA-approval to file a petition containing adequate safety data, but does not require that the safety data include a risk assessment. Risk management is a method used to identify, control, and eliminate or reduce hazards to within a range of acceptability. The goal of a risk assessment is to assess risk in an objective manner by following a decision-making process designed to systematically identify hazards, assess the degree of risk associated with those hazards, and, based on those assessed risks, identify and implement measures to eliminate or mitigate the risks to an acceptable level. A waiver process alternative would remove the

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[237] 85 FR 83484 (Dec. 22, 2020) (proposing to amend 49 CFR parts 270 and 271 to require certain railroads to develop and implement a Fatigue Risk Management Program as one component of the railroads' larger railroad safety risk reduction programs).

standardization and objectivity offered by a risk assessment, leaving it more difficult for FRA to consistently evaluate railroad operations with fewer than two crewmembers.

C. Paperwork Reduction Act

FRA is submitting the information collection requirements in this proposed rule to the Office of Management and Budget (OMB) for approval under the Paperwork Reduction Act of 1995.[238] The sections that contain the new information collection requirements and the estimated time to fulfill each requirement are as follows:

CFR Section	Respondent Universe[239]	Total Annual Responses (A)	Average Time per Response (B)	Total Annual Burden (C = A * B)	Total Cost Equivalent in U.S. Dollar (D = C * wage rates) [240]
218.123—General crew staffing requirements—Each railroad's adoption or revision of rules and practices with the requirement of subpart G (New proposed requirement)	671 railroads	3 adopted rules and practices	8 hours	24 hours	$1,859
—(d)(2) Location of crewmember(s) that is not operating the train when the train is moving—Direct communication between train crew members (New proposed requirement)	Direct communications between train crewmembers during train operations are a usual and customary practice. Consequently, there is no burden connected with this provision.				
218.127(c)—Specific passenger and tourist train operation exceptions to two-person crew requirement—Passenger railroads' emergency preparedness plan approved under 49 CFR 239.201 (New proposed requirement)	The burden for emergency preparedness plans is already included under OMB Control Number 2130-0545. Consequently, there is no additional burden associated with this requirement.				
—(d)(3) Federal Transit Administration (FTA) and designated State Safety Oversight (SSO) Agency approved Public Transportation Agency Safety Plan in accordance with 49 CFR parts 673 and 674 (New proposed requirement)	The burden for approved FTA and SSO Public Transportation Agency Safety Plans is included under OMB Control Number 2132-0558. Consequently, there is no additional burden associated with this requirement.				
218.129(b)(1) and (2)—Specific freight train exceptions to two-person crew requirement—Direct communication between train crewmembers and dispatchers (New proposed requirement)	Direct communications between train crewmembers and dispatchers during train operations are a usual and customary practice. Consequently, there is no burden connected with this provision.				

[238] 44 U.S.C. 3501 *et seq.*

[239] For purposes of this table, there are 671 railroads, excluding tourist railroads not on the general system, in the respondent universe. Additionally, FRA is currently aware of nine one-person train crew operations.

[240] Throughout the tables in this document, the dollar equivalent cost is derived from the 2020 Surface Transportation Board's Full Year Wage A&B data series using the appropriate employee group hourly wage rate that includes 75-percent overhead charges.

—(b)(3) through (7) Railroad's method and protocol for determining when communication is lost with a one-person train crew (New proposed requirement)	The burden for this requirement is included under § 218.123.				
—(c)(1)(ii)(B) Small railroad operations—Direct communication between crew members (New proposed requirement)	Direct communications between crew members during train operations are a usual and customary practice. Consequently, there is no burden connected with this provision.				
—(c)(3) Remote control operations—Controlling railroad has developed air brake and train handling instructions governing these operations (New proposed requirement)	The burden for air brake and train handling instructions is already included under OMB Control Number 2130-0008 (49 CFR part 232). Consequently, there is no additional burden associated with this requirement.				
218.131(a) through (b)(11)—Special approval petition requirements for continuance of legacy train operations staffed with a one-person train crew (New proposed requirement)	9 railroads	3 one-person train crew operation descriptions	40 hours	120 hours	$9,293
—(b)(12) Copy of any railroad rule or practice that applies to the one-person train crew operation (New proposed requirement)	The burden of this requirement is included above.				
—(b)(13) A disabled-train/post-accident protocol (New proposed requirement)	The burden for this requirement is included under § 218.131(a) through (b)(11).				
—(b)(14) and (15) Accident and incident data or any other information describing protections in lieu of a second train crewmember (New proposed requirement)	The burden for this requirement is included under § 218.131(b)(1) through (11).				
218.133(a)(2)—Special approval petition requirements for initiation of train operations staffed with fewer than two members—Passenger railroads seeking to begin train operations with fewer than two crewmembers (New proposed requirement)	There are many exceptions for passenger operations already in existence. Consequently, FRA anticipates no passenger operations would apply for special approval for one-person crews.				
—(b)(1) through (14) Petition for initiation of a train operation staffed with fewer than two crewmembers that does not meet an exception identified in §§ 218.125 through 218.131 (New proposed requirement)	671 railroads	3 waiver petitions	40 hours	120 hours	$9,293
—(b)(15) Risk assessment for initiation of a train operation staffed with fewer than two crewmembers that does not meet an exception identified in §§ 218.125 through 218.131 (New proposed requirement)	671 railroads	3 risk assessments	120 hours	360 hours	$27,878
—(b)(15) Revised risk assessment after FRA's initial of the risk assessment for a train operation staffed with fewer than two crewmembers that does not meet an exception identified in §§ 218.125 through 218.131—Railroads' response to FRA (New proposed requirement)	671 railroads	1 revised risk assessment	24 hours	24 hours	$1,859
218.135(a)—Risk assessment content and procedures—General (New proposed requirement)	The burden for this requirement is included under §§ 218.133(b)(15) and 218.137(e).				

—(b) Alternative standard—Petition for approval to use alternative methodologies (New proposed requirement)	The burden for this requirement is included under §§ 218.133(b)(15), 218.137(e), and 218.139.				
218.137(c)—Special approval procedure—Comments sent to FRA on petitions for special approval (New proposed requirement)	Railroad industry and interested parties	2 petition comments	1 hour	2 hours	$155
—(d)(1) Disposition of petitions—Hearings on petitions (New proposed requirement)	The requirements of this provision are exempted from the Paperwork Reduction Act under 5 CFR 1320.4(a)(2) because this activity is conducted during an administrative action affecting specific individuals or entities.				
—(d)(2) Special approval procedure—Disposition of petitions—Petitioners' response to FRA's special conditions to the approval of petition (New proposed requirement)	The burden for this requirement is included under § 218.137(e).				
—(e) Modified operation submitted to FRA—Legacy railroads (New proposed requirement)	9 railroads	1 risk assessment	120 hours	120 hours	$9,293
—(e) Modified operation submitted to FRA—New one-person operation (New proposed requirement)	671 railroads	2 updated risk assessments	40 hours	80 hours	$6,195
218.139—Annual railroad responsibilities after receipt of special approval—Annual review and analysis of FRA-approved train operation(s) (New proposed requirement)	671 railroads	8 annual reviews	8 hours	64 hours	$4,956
—(b)(7) Written confirmation that the risk assessment for operations approved under § 218.133 (New proposed requirement)	The burden for this requirement is included under § 218.139.				
Total[241]	671 railroads	26 responses	N/A	914 hours	$70,780

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

[241] Totals may not add due to rounding.

collection techniques or other forms of information technology, may be minimized. For information or a copy of the paperwork package submitted to OMB, contact Ms. Hodan Wells, Information Collection Clearance Officer, at 202-493-0440. Organizations and individuals desiring to submit comments on the collection of information requirements should direct them via email to Ms. Wells at Hodan.Wells@dot.gov.

OMB is required to decide concerning the collection of information requirements contained in this rule between 30 and 60 days after publication of this document in the **Federal Register**. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. FRA is not authorized to impose a penalty on persons for violating information collection requirements that 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,[242] 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

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[242] 64 FR 43255 (Aug. 10, 1999).

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.

FRA has analyzed this proposed rule in accordance with the principles and criteria contained in Executive Order 13132. FRA has determined that this proposed rule has no federalism implications, other than the possible preemption of State laws under 49 U.S.C. 20106. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply, and preparation of a federalism summary impact statement for the proposed rule is not required.

E. International Trade Impact Assessment

The Trade Agreements Act of 1979[243] 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 proposed rule 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 proposed rule consistent with the National Environmental Policy Act[244] (NEPA), the Council of Environmental Quality's NEPA implementing

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[243] 19 U.S.C. Ch. 13.
[244] 42 U.S.C. 4321 *et seq.*

regulations,[245] and FRA's NEPA implementing regulations[246] and determined that it is categorically excluded from environmental review and therefore does not require the preparation of an environmental assessment (EA) or environmental impact statement (EIS). Categorical exclusions (CEs) are actions identified in an agency's NEPA implementing regulations that do not normally have a significant impact on the environment and therefore do not require either an EA or EIS.[247] Specifically, FRA has determined that this proposed rule is categorically excluded from detailed environmental review.[248]

The main purpose of this rulemaking is to establish minimum requirements for the size of train crew staffs depending on the type of operation to maintain safety. This rule would not directly or indirectly impact any environmental resources and would not result in significantly increased emissions of air or water pollutants or noise. In analyzing the applicability of a CE, FRA must also consider whether unusual circumstances are present that would warrant a more detailed environmental review.[249] FRA has concluded that no such unusual circumstances exist with respect to this proposed rule and it meets the requirements for categorical exclusion.[250]

Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, FRA has determined this undertaking has no potential to affect historic properties.[251] FRA has also determined that this rulemaking does not approve a project resulting in a use of a resource protected by Section 4(f).[252] Further, FRA

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[245] 40 CFR parts 1500 through 1508.
[246] 23 CFR part 771.
[247] 40 CFR 1508.4.
[248] *See* 23 CFR 771.116(c)(15) (categorically excluding "[p]romulgation of rules, the issuance of policy statements, the waiver or modification of existing regulatory requirements, or discretionary approvals that do not result in significantly increased emissions of air or water pollutants or noise").
[249] 23 CFR 771.116(b).
[250] 23 CFR 771.116(c)(15).
[251] *See* 16 U.S.C. 470.
[252] *See* Department of Transportation Act of 1966, as amended (Pub. L. 89-670, 80 Stat. 931); 49 U.S.C. 303.

reviewed this proposed rulemaking and found it consistent with Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad."

G. Executive Order 12898 (Environmental Justice)

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and DOT Order 5610.2B[253] require DOT agencies to achieve environmental justice as part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including interrelated social and economic effects, of their programs, policies, and activities on minority populations and low-income populations. The DOT Order instructs DOT agencies to address compliance with Executive Order 12898 and requirements within the DOT Order in rulemaking activities, as appropriate, and also requires consideration of the benefits of transportation programs, policies, and other activities where minority populations and low-income populations benefit, at a minimum, to the same level as the general population as a whole when determining impacts on minority and low-income populations. FRA has evaluated this proposed rule under Executive Order 12898 and the DOT Order and has determined it would not cause disproportionately high and adverse human health and environmental effects on minority populations or low-income populations.

H. Unfunded Mandates Reform Act of 1995

Under section 201 of the Unfunded Mandates Reform Act of 1995,[254] 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

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[253] *Available at:* https://www.transportation.gov/regulations/dot-order-56102b-department-transportation-actions-address-environmental-justice.
[254] Pub. L. 104-4, 2 U.S.C. 1531.

law)." Section 202 of the Act[255] further requires that "before promulgating any general notice of proposed rulemaking that is likely to result in promulgation of any rule that includes any Federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100,000,000 or more (adjusted annually for inflation) in any 1 year, and before promulgating any final rule for which a general notice of proposed rulemaking was published, the agency shall prepare a written statement" detailing the effect on State, local, and tribal governments and the private sector. This proposed rule would not result in the expenditure, in the aggregate, of $100,000,000 or more (as adjusted annually for inflation) in any one year, and thus preparation of such a statement is not required.

I. Energy Impact

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," requires Federal agencies to prepare a Statement of Energy Effects for any "significant energy action."[256] FRA evaluated this proposed rule under Executive Order 13211 and determined that this regulatory action is not a "significant energy action" within the meaning of Executive Order 13211.

J. Privacy Act Statement

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, to www.regulations.gov, as described in the system of records notice, DOT/ALL-14 FDMS, accessible through www.dot.gov/privacy. To facilitate comment tracking and response, we encourage commenters to provide their name, or the name of their organization; however, submission of names is completely optional. Whether or not commenters identify themselves, all timely comments will be fully considered. If you wish to provide

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[255] 2 U.S.C. 1532.
[256] 66 FR 28355 (May 22, 2001).

comments containing proprietary or confidential information, please contact the agency for alternate submission instructions.

List of Subjects in 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. Amend § 218.5 by adding definitions in alphabetical order for "Associate Administrator", "FTA", "Hazard", "Mishap", "Risk", "Risk assessment", "Switching service", "Tourist train operation", "Tourist train operation that is not part of the general railroad system of transportation", "Trailing tons", and "Train" 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.

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FTA means the Federal Transit Administration.

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Hazard means an existing or potential condition that could lead to an unplanned event or series of events (i.e., mishap) that can cause an accident or incident; injury,

illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment.

* * * * *

Mishap means an event or condition or series of events or conditions resulting in an accident or incident.

Risk means the combination of the expected probability (or frequency of occurrence) and the consequence (or severity) of a hazard.

Risk assessment means the process of determining, either quantitatively or qualitatively, the measure of risk associated with train operations with fewer than two crewmembers under all intended operating conditions.

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Switching service means classifying 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 locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement.

Tourist train operation means a tourist, scenic, historic, or excursion train operation.

Tourist train operation that is not part of the general railroad system of transportation means a tourist, scenic, historic, or excursion train 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.

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3. Add subpart G to read as follows:

Subpart G – Train Crew Size Safety Requirements

Sec.

Subpart G –Train Crew Size Safety Requirements

§ 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 for safe train operations under all operating conditions.

(b) This subpart prescribes minimum requirements for the size of different train crew staffs depending on the type of operation and operating conditions. The minimum crew staffing requirements reflect the safety risks posed to railroad employees, passengers, the public, and the environment. This subpart also prescribes minimum requirements for the location of a second crewmember 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 General train crew staffing requirements.

(a) *General.* Each railroad shall comply with the requirements of this subpart, and may adopt its own rules or practices consistent with the requirements of this subpart.

If 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 implementing the requirements of this subpart, that person shall be considered to have violated the requirements of this subpart.

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

(c) *Hazardous material two-person train crew mandate.* For the purposes of this paragraph (c), a tank car containing residue of a hazardous material as defined in § 171.8 of this title is not considered a loaded car. None of the exceptions in §§ 218.125 through 218.133 are applicable when any train is transporting:

(1) Twenty (20) or more loaded tank cars or loaded intermodal portable tanks of any one or any combination of hazardous materials identified in § 232.103(n)(6)(i)(B) of this chapter; or

(2) One or more car loads of rail-security sensitive materials (RSSM) as defined in § 1580.3 of this title.

(d) *Location of crewmember(s) 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 if:

(1) 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 and the locomotive engineer in the cab of the controlling locomotive can directly communicate with each other;

(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.

§ 218.125 General exceptions to train crew staffing requirements.

Except as provided in § 218.123(c), the following general exceptions apply to the requirements in § 218.123 for two-person crew staffing and the location of crewmember(s) when the train is moving. A train does not require a minimum of two crewmembers under the following conditions:

(a) *Helper service.* The train is performing helper service, i.e., 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; or

(b) *Lite locomotive.* The train is 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.

§ 218.127 Specific passenger and tourist train operation exceptions to crew staffing requirements.

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

(a) The train is a tourist train operation that is not part of the general railroad system of transportation;

(b) A passenger or tourist train operation in which:

(1) The locomotive engineer is moving cars empty of passengers; and

(2) Passengers will not board the train's cars until the crew conducts a safety briefing on the safe operation and use of the train's exterior side doors, in accordance with § 238.135 of this chapter;

(c) A passenger or tourist 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 part 239 of this chapter) the passenger railroad's

emergency preparedness plan for this operation is approved under § 239.201 of this chapter; or

(d) A rapid transit operation in an urban area, i.e., an urban rapid transit system 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 operator has an FTA/SSO-approved Public Transportation Agency Safety Plan in accordance with parts 673 and 674 of this title.

§ 218.129 Specific freight train exceptions to crew staffing requirements.

(a) *Requirements for mine load out, plant dumping, or similar operation exception.* A unit freight train, i.e., a train composed of cars carrying a single type of commodity, is being loaded or unloaded in an assembly line manner while the train moves at 10 miles per hour or less on a track which is temporarily made inaccessible from the general railroad system of transportation. During the loading or unloading process, there must not be any duties requiring a second crewmember (e.g., no operation of a hand-operated switch, filling out paperwork, or calling of signal indications). If the operation is overseen by another person, typically in a tower or on the ground, that person must have the capability of communicating with the locomotive engineer operating the train.

(b) *Requirements for certain specific freight train exceptions.* Each railroad that implements an operation, described as an exception in paragraph (c) of this section, shall adopt and comply with a railroad operating rule or practice for its train operation with

fewer than two crewmembers that complies with the following requirements of this paragraph (b):

(1) A one-person train crewmember must remain in the locomotive cab during normal operations and may leave the locomotive cab only in case of an emergency affecting railroad operations;

(2) A one-person train crewmember must contact the dispatcher whenever it can be anticipated that radio communication could be lost, e.g., before the train enters a tunnel, unless technology or a protocol is established to monitor the train's real-time progress;

(3) If the railroad cannot monitor the train's real-time progress, the railroad must have a method of determining the train's approximate location when communication is lost with the one-person crew;

(4) The railroad must establish a protocol for determining when search-and-rescue operations shall be initiated when all communication is lost with a one-person train crew;

(5) A one-person train operation's lead locomotive must be equipped with an alerter, as defined in § 229.5 of this chapter, and a one-person train crewmember must test that alerter to confirm it is working before departure;

(6) The dispatcher must confirm with a one-person train crewmember that the train is stopped before conveying a mandatory directive by radio transmission as required in § 220.61 of this chapter; and

(7) A one-person train crewmember must have a working radio on the lead locomotive and a redundant, electronic device appropriate for railroad communications as permitted in part 220, subpart C, of this chapter.

(c) *Exceptions*. Except as provided in § 218.123(c), the following freight train operations are excepted from the requirements in § 218.123 for two-person crew staffing and location of crewmember(s) when the train is moving.

(1) *Small railroad operations.* A freight train operated on a railroad and by an employee of a railroad with fewer than 400,000 total employee work hours annually may operate with one crewmember at a maximum authorized speed not exceeding 25 miles per hour under either of the following sets of conditions:

(i)(A) 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; and

(B) The total length of the train is no greater than 6,000 feet; or

(ii)(A) A second train crewmember, other than the locomotive engineer, is intermittently assisting the train's movements; and

(B) The second train crewmember and the locomotive engineer in the cab of the controlling locomotive can directly communicate with each other;

(2) *Work train operations.* During work train operations when a non-revenue service train that does not exceed 4,000 trailing tons is used for the administration and upkeep service of the railroad. This includes when such a work train is traveling to or from a work site; or

(3) *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:

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

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

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

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

(v) 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;

(vi) Movements are restricted from operating on any grade greater than 1 percent that extends for more than half a mile; and

(vii) 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.

§ 218.131 Special approval petition requirements for continuance of legacy train operations staffed with a one-person train crew.

(a) Except as provided in § 218.123(c), a one-person train operation that has been established for at least two years before [**EFFECTIVE DATE OF FINAL RULE**], may continue if the railroad files a special approval petition under § 218.137, containing a description of the operation no later than [**DATE 90 DAYS AFTER EFFECTIVE DATE OF FINAL RULE**]. A railroad is not required to file a special approval petition if the one-person operation is limited to an exception covered by § 218.125, § 218.127, or § 218.129.

(b) The special approval petition shall, at a minimum, include the following:

(1) The name, title, address, telephone number, and email address of the primary person to be contacted regarding review of the special approval petition;

(2) The location of the continuing operation, with as much specificity as can be provided, as to industries or communities served, and track segments, territories, divisions, or subdivisions operated over;

(3) The class(es) of track operated over, the method of operation, and a list of the signal and train control systems, devices, and appliances installed and in operation;

(4) 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;

(5) The maximum authorized speed of the operation;

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

(7) The maximum number of cars and tonnage set for the operation, if any;

(8) Whether the one-person operation is permitted to haul hazardous materials of any quantity and type, and the approximate percentage of carload traffic in the one-person operation that is hazardous materials;

(9) Whether any limitations are placed on a person operating as a one-person train crew. Such limitations may include, but are not limited to, a maximum number of miles or hours during a single tour of duty, or limitations placed on a person in coordination with a fatigue mitigation plan;

(10) Information regarding other operations traveling 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 (e.g., passenger trains or freight trains hauling hazardous materials);

(11) A detailed description of any technology that is used to perform tasks typically performed by a second crewmember, or that prevents or mitigates the consequences of accidents or incidents;

(12) A copy of any railroad rule or practice that applies to the one-person train crew operation, but does not apply to train crew operations with two or more

crewmembers. FRA will not approve a petition unless these railroad rules or practices include the following requirements:

(i) The one-person train crewmember must remain in the locomotive cab during normal operations and may leave the locomotive cab only in case of an emergency;

(ii) The one-person train crewmember must contact the dispatcher whenever it can be anticipated that radio communication could be lost, e.g., before the train enters a tunnel, unless technology or a protocol is established to monitor the train's real-time progress;

(iii) If the railroad cannot monitor the train's real-time progress, the railroad must have a method of determining the train's approximate location when communication is lost with the one-person crew;

(iv) The railroad must establish a protocol for determining when search-and-rescue operations shall be initiated when all communication is lost with the one-person train crew;

(v) The one-person train operation's lead locomotive must be equipped with an alerter, as defined in § 229.5 of this chapter, and the one-person train crewmember must test that alerter to confirm it is working before departure;

(vi) The dispatcher must confirm with the one-person train crewmember that the train is stopped before conveying a mandatory directive by radio transmission as required in § 220.61 of this chapter; and

(vii) The one-person train crewmember must have a working radio on the lead locomotive and a redundant, electronic device appropriate for railroad communications as permitted in part 220, subpart C, of this chapter;

(13) A disabled-train/post-accident protocol that quickly brings railroad employees to the scene of a disabled train or accident. The protocol must describe the role and responsibilities of the one-person train crewmember and any other railroad

employees, including supervisors, with responsibility to address a disabled train or accident. The proposed protocol must also describe any logistics and the railroad's expected response time(s). A passenger train operation with an approved emergency preparedness plan under part 239 of this chapter satisfies the requirement in this paragraph (b)(13);

(14) Five (5) years of accident and incident data, as required by part 225 of this chapter, for the operation identified in paragraph (b)(2) of this section or, for operations established less than five (5) years before [**EFFECTIVE DATE OF FINAL RULE**], accident and incident data for the operation from the date the operation was established; and

(15) Any other information describing protections provided in lieu of a second train crewmember, or relevant data or analysis, or both, for FRA to consider in determining whether approving the special approval petition is consistent with railroad safety.

(c) FRA may request any additional information, beyond what is provided in the petition, that it deems necessary.

§ 218.133 Special approval petition requirements for initiation of train operations staffed with fewer than two crewmembers.

(a) *General.* (1) With the exception of operations permitted under §§ 218.125 through 218.131, no railroad may operate a train with fewer than two crewmembers unless it receives special approval for the operation under this subpart.

(2) Passenger railroads seeking to begin train operations with fewer than two crewmembers must obtain FRA's approval under § 218.137 and have either:

(i) An approved passenger train emergency preparedness plan under part 239 of this chapter for the operation; or

(ii) An approved waiver from the passenger train emergency preparedness plan requirements as permitted under part 211 of this chapter. A passenger railroad may petition FRA for both a waiver under part 211 and special approval for initiation of train operations staffed with fewer than two crewmembers in the same filing.

(b) *Petition for initiation of a train operation staffed with fewer than two crewmembers.* Each petition for initiation of a train operation with fewer than two crewmembers that does not meet an exception identified in §§ 218.125 through 218.131 must contain sufficient information for FRA to determine whether approving the petition operation is consistent with railroad safety. At a minimum, a petition must include:

(1) The name, title, address, telephone number, and email address of the primary person to be contacted regarding review of the special approval petition;

(2) The location of the operation, with as much specificity as can be provided, as to industries or communities served, and track segments, territories, divisions, or subdivisions operated over;

(3) The class(es) of track to be operated over, the method of operation, and a list of the signal and train control systems, devices, and appliances installed and in operation;

(4) 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;

(5) The maximum authorized speed of the operation;

(6) The approximate average number of miles and hours a person is projected to operate as a train crewmember in a fewer than two-person train operation;

(7) The maximum number of cars and tonnage proposed for the operation, if any;

(8) Whether the operation will be permitted to haul hazardous materials (as defined by § 171.8 of this title) of any quantity and type;

(9) Whether any limitations will be placed on a person operating as a one-person train crew. Such limitations may include, but are not limited to, a maximum number of miles or hours during a single tour of duty, or limitations placed on a person in coordination with a fatigue mitigation plan;

(10) Information regarding other operations that may travel on the same track as, or an adjacent track to, the train operation staffed with fewer than two crewmembers. Such information shall include, but is not limited to, the volume of traffic and the types of opposing moves (e.g., passenger or freight trains hauling hazardous materials);

(11) A detailed description of any technology that will be used to perform tasks typically performed by a second crewmember, or that will prevent or significantly mitigate the consequences of accidents or incidents;

(12) A copy of any railroad rule or practice that will apply to the proposed train operation(s) with fewer than two crewmembers, but does not apply to train crew operations with two or more crewmembers;

(13) A disabled-train/post-accident protocol that quickly brings railroad employees to the scene of a disabled train or accident. The protocol must describe the role and responsibilities of the one-person train crewmember and any other railroad employees, including supervisors, with responsibility to address a disabled train or accident. The protocol must also describe any logistics and the railroad's expected response time(s). A passenger train operation with an approved emergency preparedness plan under part 239 of this chapter satisfies the requirement in this paragraph (b)(13);

(14) Five (5) years of accident and incident data, as required by part 225 of this chapter, for the operation identified in paragraph (b)(2) of this section, when operating with two or more crew members, or, for operations established less than five (5) years before [**EFFECTIVE DATE OF FINAL RULE**], accident and incident data for the operation from the date the operation was established;

(15) A risk assessment of the proposed operation that meets the requirements of § 218.135; and

(16) Any other information describing protections provided in lieu of a second train crewmember, or other relevant data or analysis.

(c) *Additional information*. FRA may request any additional information, beyond what is provided in the petition, that it deems necessary.

§ 218.135 Risk assessment content and procedures.

(a) *General.* A risk assessment submitted under this subpart must meet the following requirements:

(1) Contain a complete description of the railroad environment, including, at a minimum:

(i) All authorized method(s) of operation;

(ii) All applicable operating rules and practices;

(iii) Hours of operation;

(iv) Qualifications and certifications of crewmembers;

(v) Number and frequency of trains involved;

(vi) The tonnage, length, and makeup of the trains involved;

(vii) The route and terrain over which the trains will be operated (e.g., maximum grade, sight distances);

(viii) Number and types of grade crossings;

(ix) Amount and types of hazardous materials to be transported, if any;

(x) The characteristics of the geographic areas through which the trains will operate (e.g., population density and proximity to environmentally sensitive areas); and

(xi) Any other relevant factor.

(2) Contain a list and descriptions of all functions, duties, and tasks associated with the proposed operation to be performed by the one crewmember, other railroad employee(s), or equipment, including, at a minimum, any function performed:

(i) To prepare a train for operation (including, but not limited to, pre-departure inspections, obtaining track bulletins, orders, or manifests, managing the train consist, including train makeup, obtaining and ensuring the accuracy of the train consist, arming and testing the end-of-train device, and performing brake tests);

(ii) To operate a train (including, but not limited to, operating and controlling the train, interacting with non-crewmembers such as the dispatcher or roadway workers, and responding to emergencies or unexpected events); and

(iii) To ensure safety once a train has stopped moving (e.g., including, but not limited to, securing the train).

(3) Describe the allocation of all functions, duties, and tasks to the one crewmember, other railroad employee(s), or equipment.

(4) Contain a hazard analysis for the proposed train operation's functions, duties, and tasks, including:

(i) A hazard log consisting of a comprehensive description of all hazards associated with the proposed train operation.

(ii) An assessment of each hazard in terms of the severity, measured as the worst-credible mishap resulting from the hazard and categorized in accordance with Table 1 to this paragraph (a)(4)(ii):

Table 1 to § 218.135(a)(4)(ii)		
SEVERITY CATEGORIES		
Category	**Severity Ranking (1 being the most severe)**	**Definition**

Catastrophic	1	Results in one or more of the following: fatality, irreversible significant environmental damage, or significant monetary loss. Accidents/incidents that must be reported to FRA telephonically under § 225.9 of this chapter are considered catastrophic.
Critical	2	Results in one or more of the following: significant injury (as defined in § 225.5 of this chapter), reversible significant environmental damage, or reportable monetary loss. Accidents/incidents that are not telephonically reported under § 225.9 of this chapter, but are still FRA-reportable under § 225.19 of this chapter, are considered critical.
Marginal	3	Results in one or more of the following: minor injuries (i.e., injuries that are not significant as defined in § 225.5 of this chapter), reversible non-significant environmental damage, or monetary loss. Mishaps that are not FRA-reportable accidents/incidents, but are considered accountable rail equipment accidents/incidents as defined in § 225.5 of this chapter, are considered marginal.
Negligible	4	Results in one or more of the following: no injuries, no environmental damage, or equipment or railroad structure damages that do not require repair.

(iii) An assessment of each hazard in terms of probability of occurrence as defined in Table 2 to this paragraph (a)(4)(iii):

Table 2 to § 218.135(a)(4)(iii)

PROBABILITY LEVELS

Description	**Level**	**Qualitative Characterization of Probability**	**Quantitative Characterization of Probability[1]**
FREQUENT	A	Likely to occur frequently	Greater than once every 1,000 operating hours
PROBABLE	B	Likely to occur several times	Between once every 1,000 hours and once every 100,000 hours
OCCASIONAL	C	Likely to occur once, but not several times	Between once every 100,000 hours and once every 10,000,000 hours
REMOTE	D	Unlikely but possible to occur	Between once every 10,000,000 hours and once every 1,000,000,000 hours
IMPROBABLE	E	So unlikely that it can be assumed the occurrence may not be experienced	Less than once every 1,000,000,000 hours

[1] Probability of a hazard occurring per 1,000 operating hours.

(iv) A hazard mitigation analysis outlining the sustainable actions and associated components, equipment, systems, or processes that are put in place to reduce or eliminate the probability or severity, or both, of each hazard. At a minimum, a hazard mitigation analysis must consider the following:

(A) The design of the system, equipment, and components, including equipment reliability and the necessary functions to be performed, in both a normal operation and in a failed state; and

(B) The human factors associated with the processes and tasks to be performed, including the required skills and capabilities, the operating environment, and existing or potential impairments.

(5) A risk matrix in the format of Table 3 to this paragraph (a)(5) that classifies the severity and likelihood of each partially mitigated or unmitigated hazard as follows:

Table 3 to § 218.135(a)(5)

Risk Matrix

PROBABILITY	SEVERITY			
	(1) Catastrophic	(2) Critical	(3) Marginal	(4) Negligible
(A) FREQUENT	1A	2A	3A	4A
(B) PROBABLE	1B	2B	3B	4B
(C) OCCASIONAL	1C	2C	3C	4C
(D) REMOTE	1D	2D	3D	4D
(E) IMPROBABLE	1E	2E	3E	4E

(6) A risk report of the train operation staffed with fewer than two crewmembers, documenting the basis for acceptability of all partially mitigated and unmitigated hazards identified in the matrix required by paragraph (a)(5) of this section. The risk report must, at a minimum, categorize the risk of each partially mitigated and unmitigated hazard as follows:

(i) *Unacceptable*. Categories 1A, 1B, 1C, 1D, 2A, 2B, 2C, 3A, 3B, and 4A are unacceptable. A railroad should not file a petition for special approval with a hazard in this category as FRA will not approve an operation with a partially mitigated or unmitigated hazard that is categorized as unacceptable;

(ii) *Acceptable under specific conditions*. Categories 1E, 2D, 3C, 3D, 4B, and 4C are acceptable under specific conditions. A railroad's risk report must describe why the railroad finds the conditions acceptable. A hazard will be acceptable under specific conditions if FRA finds that accepting such hazard is consistent with railroad safety; and

(iii) *Acceptable*. Categories 2E, 3E, 4D, and 4E are acceptable. FRA will not deny a petition for special approval because of an appropriately categorized acceptable hazard that is partially mitigated or unmitigated.

(b) *Alternative standard.* A railroad may petition the Associate Administrator for approval to use alternative methodologies or procedures, or both, other than those required by paragraph (a) of this section to assess the risk associated with an operation proposed under this section. If, after providing public notice of the request for approval and an opportunity for public comment on the request, the Associate Administrator finds that any such petition demonstrates that the alternative proposed methodology or procedures, or both, will provide an accurate assessment of the risk associated with the operation, the Associate Administrator may approve the use of the proposed alternative(s).

§ 218.137 Special approval procedure.

(a) *Petition*. Each railroad submitting a petition under §§ 218.131 and 218.133 shall send the petition by email to *FRAOPCERTPROG@dot.gov*. FRA will make the petition publicly available at *https://www.regulations.gov*.

(b) ***Federal Register*** *notice.* FRA will publish a notice in the **Federal Register** concerning each petition under §§ 218.131 and 218.133.

(c) *Comment.* Not later than 60 days from the date of publication of the notice in the **Federal Register** under paragraph (b) of this section, any person may comment on the petition.

(1) Each comment shall provide all relevant information and data in support of the commenter's position.

(2) Each comment shall be submitted to FRA through https://www.regulations.gov.

(d) *Disposition of petitions*. (1) If the Administrator finds it necessary or desirable, FRA will conduct a hearing on a petition in accordance with its rules of practice in part 211 of this chapter.

(2) A petition must not be implemented until approved. If FRA finds that the petition complies with the requirements of § 218.131 or § 218.133, as applicable, and that approving the petition is consistent with railroad safety, FRA will grant the petition, normally within 120 days of its receipt. If the petition is neither granted nor denied within 120 days, the petition remains pending for decision. FRA may attach special conditions to the approval of the petition. Following the approval of a petition, FRA may reopen consideration of the petition for cause stated.

(3) If FRA finds that a petition does not comply with the requirements of this subpart or that approving the petition would not be consistent with railroad safety, FRA will deny the petition, normally within 120 days of its receipt.

(4) When FRA decides a petition, reopens consideration of a petition, or closes a reopened petition, FRA will send written notice of the decision to the petitioner and publish that decision in the docket.

(e) *Modifications.* A railroad that intends to materially modify an operation subject to an FRA approval under this section shall submit a description of how it intends to modify the operation, along with either a new or an updated risk assessment

accounting for the identified proposed modifications. A material modification submission is required for material modifications to both legacy train operations staffed with a one-person train crew under § 218.131 and newly initiated train operations staffed with fewer than two crewmembers under § 218.133. The new or updated risk assessment must meet the requirements of § 218.135 and be submitted by email to *FRAOPCERTPROG@dot.gov* at least 60 days before proposing to implement any such modification. When FRA decides on a material modification to a petition, FRA will send written notice of the decision to the petitioner and publish that decision in the same docket created for the petition in paragraph (a) of this section. FRA may reopen consideration of a petition based on a material modification, deny the material modification, or grant the material modification with or without special conditions to the approval. A material modification must not be implemented until approved. If the material modification submission is neither granted nor denied within 60 days, the petition remains pending for decision. For the purposes of this paragraph (e), a material modification is a change:

(1) To a railroad's operations, infrastructure, locomotive control technology, or risk mitigation technology, that may affect the safety of the operation;

(2) That would affect the assumptions underlying the risk assessment on which an FRA approval under this section is based; or

(3) That would affect the assumptions underlying the risk assessment's risk calculations or mitigations on which an FRA approval under this section is based.

§ 218.139 Annual railroad responsibilities after receipt of special approval.

(a) Each railroad that receives special approval under either § 218.131 or § 218.133 shall conduct a formal review and analysis each calendar year, of the FRA-approved train operation(s) with fewer than two crewmembers, and report to FRA its

findings and conclusions from its review no later than March 31 of the following year to *FRAOPCERTPROG@dot.gov*.

(b) A railroad's annual report must include the safety data and information listed in paragraphs (b)(1) and (2) of this section for any FRA-approved train operation with fewer than two crewmembers.

(1) The total number of:

(i) FRA-reportable accident/incident under part 225 of this chapter, including subtotals for accidents/incidents that occurred at a highway-rail grade crossing and those that did not occur at a highway-rail grade crossing, and subtotals by State and cause. If an accident/incident was FRA-reportable for more than one reason (e.g., the accident/incident occurred at a highway-rail grade crossing and resulted in rail equipment damages higher than the current reporting threshold), the accident/incident shall only be listed once in the total calculation;

(ii) FRA-reportable employee fatalities;

(iii) FRA-reportable employee injuries;

(iv) Trespasser fatalities at a highway-rail grade crossing;

(v) Trespasser injuries at a highway-rail grade crossing;

(vi) Passenger fatalities at a highway-rail grade crossing;

(vii) Passenger injuries at a highway-rail grade crossing;

(viii) Instances where a railroad employee did not comply with a railroad rule or practice applicable to the FRA-approved train operation(s) with fewer than two crewmembers, but not applicable to train crew operations with two or more crewmembers;

(ix) Instances where a person certified as both a locomotive engineer and conductor had a certification revoked for violation of an operating rule or practice that

occurred when the person was operating per an FRA-approved train operation with fewer than two crewmembers;

(x) Accountable rail equipment accident/incident under part 225 of this chapter;

(xi) Instances when the railroad was required to implement its disabled-train/post-accident protocol for an FRA-approved train operation with fewer than two crewmembers;

(xii) Instances when a dispatcher unexpectedly lost communication with an FRA-approved train operation with fewer than two crewmembers;

(xiii) Employee hours worked; and

(xiv) Train miles.

(2) For each instance counted in the totals reported in paragraphs (b)(1)(i) through (xii) of this section, a railroad's annual report must clearly identify each instance by date and location and provide a complete factual description of the event.

(c) The annual report must also include written confirmation that the risk assessment for operations approved under § 218.133, including all calculations and assumptions, remain unchanged, or for an operation approved under § 218.131, written confirmation that the operation remains substantially the same as that described in the railroad's applicable special approval petition and that no technology changes have been implemented or new or additional hazards identified.

(1) If any risk assessment calculation or assumption changes for an operation approved under § 218.133, or an operation approved under § 218.131 is found to have substantially changed, a new or updated risk assessment meeting the requirements of § 218.135 must be prepared and submitted with the railroad's annual report. This annual reporting requirement does not negate the requirement to submit a new or updated risk assessment when making a material modification to an operation as required in § 218.137.

(2) Any new or updated risk assessment submitted in accordance with this paragraph (c) must include a written plan and schedule for implementing any mitigations required to address any newly identified hazards.

(d) FRA will review and respond to a railroad's annual report submission by September 30 of the year it is submitted. FRA's response may include advice or recommendations. FRA may reopen consideration of a petition under § 218.137 based on a finding that a railroad's annual report submission suggests that the petition does not comply with the requirements of this subpart or that the operation is no longer consistent with railroad safety.

Issued in Washington, D.C.

Amitabha Bose,
Administrator.

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