

DEPARTMENT OF TRANSPORTATION**Federal Railroad Administration****49 CFR Parts 217, 218, 229, and 299**

[Docket No. FRA–2016–0036, Notice No. 2]

RIN 2130–AC51

Locomotive Image and Audio Recording Devices for Passenger Trains

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

ACTION: Final rule.

SUMMARY: FRA is requiring the installation of inward- and outward-facing locomotive image recording devices on all lead locomotives in passenger trains, as required by the Fixing America's Surface Transportation Act (FAST Act). In general, the final rule requires that these devices record while a lead locomotive is in motion and retain the data in a crashworthy memory module. The rule also treats locomotive-mounted recording devices on passenger locomotives as "safety devices" under existing Federal railroad safety regulations to prohibit tampering with or disabling them. Further, this rule governs the use of passenger locomotive recordings to conduct operational tests to determine passenger railroad operating employees' compliance with applicable railroad rules and Federal regulations. Finally, this rule requires Texas Central Railroad (TCRR) to install and maintain trainset image recording systems appropriate to TCRR's operation.

DATES: This final rule is effective November 13, 2023.

ADDRESSES: *Docket:* For access to the docket to read background documents or comments received, go to <https://www.regulations.gov> at any time.

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Table of Abbreviations

The following abbreviations are used in this document's preamble:

- AAR—Association of American Railroads
- Amtrak—National Railroad Passenger Corporation
- APTA—American Public Transportation Association
- BLET—Brotherhood of Locomotive Engineers and Trainmen
- C3RS—Confidential Close Call Reporting System
- CFR—Code of Federal Regulations
- DOT—Department of Transportation
- FAST Act—Fixing America's Surface Transportation Act
- FRA—Federal Railroad Administration
- Metra—Commuter Rail Division of the Illinois Regional Transportation Authority
- Metrolink—Southern California Regional Rail Authority
- NCTD—North Country Transit District
- NPRM—Notice of Proposed Rulemaking
- NTSB—National Transportation Safety Board
- OEM—Original equipment manufacturer
- PTC—Positive Train Control
- RIA—Regulatory Impact Analysis
- SMART—International Association of Sheet Metal, Air, Rail and Transportation Workers
- TCRR—Texas Central Railroad
- TTD—Transportation Trades Department, American Federation of Labor and Congress of Industrial Organizations (AFL-CIO)

I. Executive Summary

FRA is publishing this final rule as mandated by section 11411 of the FAST Act, codified at 49 U.S.C. 20168 (the Statute), and under the agency's general railroad safety rulemaking authority at 49 U.S.C. 20103.¹ The Statute requires FRA (as the Secretary of Transportation's delegate)² to

¹ The former Federal Railroad Safety Act of 1970, as codified at 49 U.S.C. 20103, provides that "[t]he Secretary of Transportation, as necessary, shall prescribe regulations and issue orders for every area of railroad safety supplementing laws and regulations in effect on October 16, 1970."

² The Secretary's responsibility under 49 U.S.C. 20103, 20168, and the balance of the railroad safety laws, is delegated to the Federal Railroad Administrator. 49 CFR 1.89.

promulgate regulations requiring each railroad carrier that provides regularly scheduled intercity rail passenger or commuter rail passenger transportation to the public to install inward- and outward-facing image recording devices in all controlling locomotives of passenger trains.³ This final rule implements the Statute's requirements regarding such recording devices on "controlling" locomotives, which will normally be "lead" locomotives consistent with FRA's existing regulations on locomotive event recorders. Before the Statute was enacted, the Railroad Safety Advisory Committee (RSAC) accepted a task from FRA in 2014 to address National Transportation Safety Board (NTSB) Safety Recommendations R-10-01 & -02⁴ concerning locomotive-mounted recording devices (RSAC Task No. 14-01). The RSAC established the Recording Devices Working Group (Working Group) to recommend specific actions regarding the installation and use of locomotive-mounted recording devices, such as inward- and outward-facing video and audio recorders.⁵ The RSAC did not vote, or reach consensus, on any recommendations to FRA regarding the adoption of regulatory text addressing locomotive-mounted video or audio recording devices.

In light of the Statute's mandate, relevant NTSB recommendations, the RSAC Working Group's discussions, accident history, and railroad safety violations that FRA had investigated,⁶ FRA issued a notice of proposed rulemaking (NPRM) on July 24, 2019, proposing inward- and outward-facing image recording devices be required on all lead passenger train locomotives.⁷ FRA received comments from fifteen different individuals or organizations in response to the NPRM.

Having carefully considered the public comments in response to the NPRM, FRA issues this final rule amending the regulatory requirements of Railroad Operating Rules (49 CFR

³ A detailed discussion of the Statute's requirements is provided in the NPRM (84 FR 35712, 35714–35715).

⁴ A detailed analysis of the NTSB Recommendations is provided in the NPRM (84 FR 35712, 35715–35723).

⁵ <https://rsac.fra.dot.gov/radcms/rsac/task/GetDocument/10>. A detailed discussion of the RSAC proceedings is provided in the NPRM (84 FR 35712, 35723).

⁶ A detailed discussion of accidents investigated by FRA is provided in the NPRM (84 FR 35715–35723).

⁷ 84 FR 35712.

part 217), Railroad Operating Practices (49 CFR part 218), Railroad Locomotive Safety Standards (49 CFR part 229), and Texas Central High-Speed Rail Safety Standards (49 CFR part 299). This final rule requires intercity passenger and commuter railroads⁸ to install compliant image recording systems on the lead locomotives of all their passenger trains by October 12, 2027, except for TCRR, which is required to have compliant image recording systems installed on its trainsets prior to commencing revenue service, as specified under part 299. Further, beginning October 12, 2024, any locomotive image recording system installed on new, remanufactured,⁹ or existing passenger train lead locomotives must meet the specified requirements of this final rule, including the requirement that the last twelve hours of data recorded be stored in a memory module that meets the existing crashworthiness requirements in part 229. In addition, this final rule requires that all locomotive-mounted recording devices in passenger locomotives be treated as "safety devices" under part 218, subpart D, thereby making it a violation of applicable Federal regulations to tamper with or disable any locomotive-mounted recording system or device.

FRA notes that the image recording device requirements for passenger train locomotives in this final rule supplement FRA's existing locomotive event recorder regulation in part 229. Locomotive event recorders are required on the lead locomotives of trains traveling over 30 mph and already record numerous operational parameters that assist in accident/incident investigation and prevention (*see* 49 CFR 229.135).

FRA used a cost-benefit analysis to evaluate the impact of the final rule on passenger railroads required to install and maintain locomotive image recording devices. FRA estimated the low and high costs of this final rule over a 10-year period, using discount rates of 3 and 7 percent, with the results shown in the tables below.

⁸ As proposed in the NPRM, railroad carriers providing "intercity rail passenger transportation" and "commuter rail passenger transportation" are subject to this final rule and are the same as those covered by 49 U.S.C. 24102 (passenger railroads required to install positive train control (PTC) systems under 49 U.S.C. 20157(a)).

⁹ *See* 49 CFR 229.5.

TABLE E.1—TOTAL 10-YEAR COSTS AND BENEFITS OF LOCOMOTIVE IMAGE RECORDING DEVICES, LOW RANGE
[Costs are in 2018 dollars, \$ in millions]

	Discounted at 7%	Discounted at 3%	Annualized at 7%	Annualized at 3%
Costs	\$42.2	\$46.2	\$6.0	\$5.4
Cost Savings	2.0	2.4	0.3	0.3
Net Costs	40.2	43.9	5.7	5.1

Qualitative Benefit: Potential reduction in safety risk resulting from deterrence of unsafe behaviors, increase to safety culture, and information for accident investigation and future accident prevention.

TABLE E.2—TOTAL 10-YEAR COSTS AND BENEFITS OF LOCOMOTIVE IMAGE RECORDING DEVICES, HIGH RANGE
[\$ In millions]

	Discounted at 7%	Discounted at 3%	Annualized at 7%	Annualized at 3%
Costs	\$87.3	\$94.0	\$12.4	\$11.0
Cost Savings	2.0	2.4	0.3	0.3
Net Costs	85.3	91.6	12.1	10.7

Qualitative Benefit: Potential reduction in safety risk resulting from deterrence of unsafe behaviors, increase to safety culture, and information for accident investigation and future accident prevention.

The primary source of expected benefits is the potential reduction in safety risk. FRA conducted a literature review to determine the effectiveness rate of inward- and outward-facing recording devices, but was unable to determine an appropriate rate. The benefits for the final rule are qualitatively discussed. The reduction in safety risk is expected to come primarily from the change in crew behavior. Railroads can deter unsafe behavior if crewmembers realize their actions may be observed on a frequent, but random, basis by railroad supervisors. Locomotive image recorders cannot directly prevent an accident from occurring, but rather can provide investigators with information after an accident occurs that can help to prevent future accidents of that type from occurring.

II. Discussion of Specific Comments and Conclusions

In the NPRM, FRA specifically requested information from the public as well as comments on its proposals. Commenters provided valuable information and comments on issues where FRA asked for comments as well as on various other issues. In total, FRA received comments from fifteen different individuals or organizations in response to the NPRM.

An FRA employee also received an email from New York’s Metropolitan Transportation Authority providing information about the economic cost of the requirements proposed in the NPRM. FRA is treating that email as a comment and it is addressed in the Regulatory Impact Analysis (RIA) of this final rule. The full email has also been

placed into the rulemaking docket along with a memorandum from FRA explaining the context for the email. Further, in its submitted comments, the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART) disagreed with FRA’s characterization in the NPRM that a public hearing would be provided only if a party was unable to adequately present his or her position by written statement; however, neither SMART, nor any other party, requested a public hearing on this rulemaking. Accordingly, a public hearing was not provided.

Most of the comments in response to the NPRM are discussed below or in the Regulatory Impact and Notices portion of this final rule. The order in which the comments are discussed in this final rule, whether by issue or by commenter, is not intended to reflect the significance of the comment raised or the standing of the commenter.

A. Inward- and Outward-Facing Recording Devices on Freight Locomotives

In the NPRM, FRA did not propose to require the installation and use of inward- and outward-facing recording devices in freight locomotives, nor did FRA propose that any of the NPRM’s requirements apply to inward- and outward-facing locomotive recording devices that have been voluntarily installed by freight railroads. While FRA discussed the issue of inward- and outward-facing recording devices on freight locomotives at various points in the NPRM, FRA specifically addressed the issue under the heading “Mandatory Installation of Inward- and Outward-

Facing Recording Devices on Freight Locomotives.” In that section, FRA discussed its decision not to propose such a requirement because: (1) the Statute did not require recording devices be installed on freight locomotives; (2) the cost of installing such devices could outweigh the safety benefits; and (3) many freight railroads, including all Class I railroads, had already installed or were in the process of installing such recording devices.

In addition, FRA specifically asked for public comment on whether some or all freight railroads should be required to equip their locomotives with recording devices and, if FRA did not require freight railroads to install these devices on their locomotives, the extent to which the requirements proposed in the NPRM should apply to inward- and outward-facing locomotive recording devices on freight railroads that have already installed such devices or install such devices in the future.

As proposed in the NPRM, FRA is declining to adopt any requirements that freight locomotives install or use inward- or outward-facing recording devices in freight locomotives, nor will any requirements of this rule apply to inward- or outward-facing locomotive recording devices that have been voluntarily installed by freight railroads. The Statute requires inward- and outward-facing image recording devices in controlling passenger locomotives as well as gives the Secretary discretion to require in-cab audio recording devices. 49 U.S.C. 20168(a), (e)(1)(A). There is no statutory requirement to create standards for, or apply any of the requirements of this final rule to, freight locomotive image or audio recordings.

Furthermore, FRA is not creating a requirement that audio devices be installed on freight locomotives.

FRA did not receive comments showing that benefits would outweigh costs for freight railroads. Accordingly, FRA declines to require freight railroads to install recording devices at this time. However, freight locomotives that are used in commuter or intercity passenger service, other than for rescue purposes, are passenger locomotives and are subject to all the final rule's requirements. In other words, freight locomotives that do not perform any passenger railroad related service, or are used only for rescue purposes, are not subject to the requirements of this final rule. Additional discussion on this topic is provided below.

1. Requiring Inward- and Outward-Facing Locomotive Recording Devices on Freight Locomotives

The Association of American Railroads (AAR) commented that requiring freight railroads to install locomotive recording devices was not necessary, as many freight railroads had already installed, or were in the process of installing, recording devices voluntarily. AAR stated that a survey of AAR's Class I member railroads showed that these railroads "will have installed approximately 20,500 inward-facing cameras and 22,000 outward-facing cameras in the near future."

The Brotherhood of Locomotive Engineers and Trainmen (BLET), the Transportation Trades Department, AFL-CIO (TTD), and SMART also expressed opposition to FRA requiring freight railroads to install inward- and outward-facing locomotive recording devices. SMART agreed with FRA's statement in the NPRM that the cost for freight railroads to implement similar procedures as those proposed in the NPRM for passenger trains may outweigh the potential safety benefits.

The NTSB and Wi-Tronix, LLC (Wi-Tronix), a company that provides connected solutions for locomotive fleets, commented that FRA should require inward- and outward-facing locomotive recording devices in freight locomotives. The NTSB contended that inward- and outward-facing audio and image recorders are needed in freight railroad operations, referencing NTSB Safety Recommendations R-10-01 and R-10-02, which were issued following four separate NTSB accident investigations involving freight rail operations. The NTSB asserted that the need for recording devices in freight railroad investigations is exactly the same as in passenger railroad investigations given that: (1) freight and

passenger trains operate on the same tracks and both pose risks of accidents that have the potential to significantly affect the public; and (2) recorded information about safety issues identified in freight railroad accidents and incidents could inform, mitigate, or prevent similar safety issues in passenger railroad operations. Therefore, the NTSB believed it would be "shortsighted" for FRA to limit the rule to apply only to lead passenger locomotives.

Like the NTSB, Wi-Tronix also commented that the rail network is integrated and that commuter and intercity passenger trains often share the same track and dispatch system, among other things, with freight trains. Acknowledging the increase in video system use for safety and operating rule compliance, Wi-Tronix stated that there "are roughly 20 times the number of freight locomotives compared with passenger locomotives," and the full safety benefits of the technology would not be realized without the requirement covering all locomotive types.

FRA recognizes the potential safety benefits of locomotive recording devices in freight locomotives as noted in the NTSB's and Wi-Tronix's comments. However, FRA disagrees that the full safety benefits of this technology can only be achieved with a specific regulatory requirement that freight railroads install inward- and outward-facing image and/or audio recorders.

As stated in the NPRM, many freight railroads, including all Class I railroads, have either already installed or are in the process of installing recording devices in their locomotives. As noted by AAR in its comment, "approximately 20,500 inward-facing cameras and 22,000 outward-facing cameras" will be installed on AAR Class I member railroads "in the near future." In addition, AAR points out in its comments that recordings from these voluntarily installed systems are already subject to the accident data preservation requirements in 49 CFR 229.135(e).¹⁰ Therefore, the data from these voluntarily installed devices in freight locomotives will be available for FRA's and the NTSB's accident investigation purposes, if necessary.

Furthermore, requiring freight railroads to comply with the final rule's requirements would be expensive with questionable benefit. FRA has

¹⁰ If a locomotive is equipped with an event recorder or "any other locomotive mounted recording device or devices designed to record information concerning the functioning of a locomotive" and is involved in a 49 CFR part 225 reportable accident, § 229.135(e) requires the railroad to preserve the data recorded for one year.

investigated few, if any, freight railroad accidents where freight locomotive image data should have been present but was not because it was destroyed in the accident. Furthermore, while the vast majority of Class I railroads have or are installing inward- and outward-facing cameras, very few short line railroads (Class II or Class III railroad) have either inward- or outward-facing cameras installed on their locomotives. In fact, for these much smaller railroads, FRA estimates that only 1% have inward-facing locomotive cameras and 25% have outward-facing cameras installed on their locomotives. This is not necessarily surprising as Class II and Class III railroads are less likely to need locomotive cameras given the lower speeds, shorter distances, and the less regular nature of the services that these railroads operate. These definitionally smaller operations would be significantly affected economically if FRA imposed the requirements of this final rule to freight railroads and would have difficulty absorbing the cost without much safety benefit.

Therefore, for the reasons explained above, FRA is declining to require freight railroads to install recording devices at this time. FRA will continue to monitor the freight industry's voluntary installation of the devices and the effectiveness of those devices in freight rail operations. Based on this continued monitoring, FRA may take additional action in a separate proceeding to address the use of locomotive recording devices on freight railroads.

In addition to its opposition to FRA requiring inward- and outward-facing recording devices on freight locomotives, AAR also suggested that FRA add language to part 229 mirroring the preemptive effect language in §§ 217.2 (preemptive effect of railroad operating rules) and 218.4 (preemptive effect of railroad operating practices). AAR asserted that both these provisions clarify FRA's intent to create a national standard and this final rule should include this preemption language for national uniformity. AAR added that, to preclude the creation of a patchwork of conflicting state and local requirements applying to freight railroads, FRA should state that its decision to not propose a locomotive recording device requirement for freight railroads reflects the agency's position that it is unnecessary to issue such a regulation.

In issuing this final rule, FRA has sought to stay within the Statute's mandate, 49 U.S.C. 20168, and not undertake a broader revision of part 229. Accordingly, FRA declines to add

specific preemption language to part 229.¹¹

2. Application of Requirements to Freight Railroads That Voluntarily Install Inward- or Outward-Facing Locomotive Recording Devices

In addition to FRA inviting comments on whether the agency should require the installation of inward- and outward-facing recording devices on freight locomotives, FRA also sought comment on whether the proposed requirements should apply to recording devices that have already been installed on freight locomotives. Except for AAR, which supported FRA's proposal to exclude freight trains from this proposed rule, all the commenters generally favored applying the requirements of this final rule to freight locomotives that have voluntarily installed inward- or outward-facing recording devices.

Based on the same reasoning provided above, the NTSB commented that FRA should ensure the same level of safety for both passenger and freight railroads and that any recording device that either a passenger or freight railroad has voluntarily installed should be required to meet the minimum standards in this final rule. While BLET, SMART, and TTD all opposed requiring freight railroads to equip their locomotives with recording devices, they all agreed that freight railroads that voluntarily install such devices should nonetheless have to comply with the final rule's railroad employee protections and adhere to a uniform national standard created by FRA and applicable to both freight and passenger locomotive recording devices, regardless of whether they were installed before or after the rule's issuance. TTD specifically urged FRA to apply the final rule's requirements to protect against employee retaliation under part 217 operational testing, regardless of whether FRA requires the installation of the locomotive recording device(s).

After considering the comments, FRA is declining to impose any of the requirements in this final rule on freight railroads that have voluntarily installed recording devices on their locomotives. However, it is FRA's expectation that all railroads that voluntarily install recording devices on their locomotives, including freight railroads, will adhere to practices that are consistent with those in this final rule, such as those provided under new part 217 requirements that serve to protect

employees from targeted testing as a form of retaliation when railroads conduct operational testing using recording devices or their recordings.

FRA has independent authority to disapprove a freight railroad's operating rules testing program, required under Part 217.¹² Therefore, if FRA finds that a freight railroad is not using its locomotive recording devices in good faith to fulfill the railroad's operational testing requirements, but is instead using locomotive cameras and/or audio recording devices to pursue retaliation against its employees, FRA could disapprove the railroad's operational testing program. FRA therefore expects freight railroads will adhere to the same, or similar, principles as being codified for passenger railroads, based on FRA's authority under the existing provision. Application of the new part 217 operational testing requirements in this final rule are discussed in Section II.L and the Section-by-Section Analysis below.

3. Application of Requirement to Freight Locomotives Performing Rescue Operations

Finally, the American Public Transportation Association (APTA) submitted a comment asking FRA whether freight locomotives that do not have inward-facing locomotive cameras compliant with this final rule would be allowed to "rescue" passenger trains that fail en route. In such situations, a freight locomotive "rescues" the failed passenger train by operating as the lead locomotive of the passenger train and hauling the train to its destination or repair point. Having considered APTA's comment, this final rule includes a new provision, § 229.139(l), that excludes freight locomotives from compliance with the requirements of new § 229.136 when they are performing rescue operations for intercity or commuter passenger trains. However, this exception applies only for the limited purposes of rescuing an intercity or commuter passenger train; a freight locomotive used in regular passenger service will not be covered by the exception. The exclusion is based on identical language in the definition of "locomotive" for purposes of FRA's Passenger Equipment Safety Standards in § 238.5 of this chapter.¹³ As FRA originally stated in establishing the Passenger Equipment Safety Standards, FRA "believes that a limited exception is warranted for a freight locomotive

used to haul a passenger train due to the failure of the passenger train's own motive power; FRA does not wish for the passenger train to be stranded."¹⁴

B. Audio Recording Devices

1. Requiring Audio Recorders on Passenger or Freight Locomotives

While the Statute gives FRA discretion to require the installation of audio-recording devices on passenger train lead locomotives and to establish corresponding technical details for such devices, FRA did not propose specific rule text in the NPRM that would require audio recording devices. Rather, FRA requested comment on numerous specific issues related to audio recorders, to evaluate whether to require audio recorders in passenger or freight locomotives in this final rule. Specifically, FRA asked about: (1) the usefulness of audio recordings in certain accident investigations; (2) what benefits they provide in addition to the benefits of image recordings; and (3) whether any benefits outweigh the installation cost for these devices, the cost of crashworthy memory for these devices, the loss of personal privacy for occupants inside the locomotive cab, or the potential that recordings from these devices could be abused by railroad supervisors.

FRA also asked for comments on whether FRA should require audio recorders to stop recording after the locomotive has stopped, if FRA were to adopt a requirement for the installation of locomotive audio recorders in the final rule. In addition, FRA asked whether FRA should require exterior recording devices that would be capable of recording sounds such as the locomotive horn/bell, audible grade crossing warning devices, engine noises, and other sounds relevant during post-accident investigations, and what the utility of these recordings would be when weighed against the potential cost. In responding to these questions, FRA asked commenters to provide specific information on the costs of installing audio recorders.

In response to these requests for comments, most parties agreed with FRA's proposal not to require the installation of locomotive audio recording devices in either passenger or freight locomotives. Commenters who advocated for the installation of such devices pointed to their usefulness in post-accident investigations. Although FRA did not receive responses to all its requests for comments related to audio recording devices, commenters did

¹¹ Under longstanding U.S. Supreme Court precedent, parts and appurtenances of locomotives have been held subject to field preemption. See *Napier v. Atlantic Coastline RR. Co.*, 272 U.S. 605 (1926).

¹² See 49 CFR 217.9(h).

¹³ Under § 238.5, neither the term "locomotive" nor "passenger equipment" "include[s] a freight locomotive when used to haul a passenger train due to failure of a passenger locomotive."

¹⁴ 64 FR 25540, 25578 (May 12, 1999).

respond to the question of when to stop audio recordings in the same manner as they responded to the question of when passenger railroads should stop their locomotive image recordings. FRA is addressing those comments together in the next section.

As for the question whether FRA should require locomotive audio recordings at all, BLET, TTD, and SMART asserted that audio recorders should not be required. Moreover, BLET and SMART specifically asked FRA to prohibit audio recordings within the locomotive cab. BLET stated that, although audio and image recordings could be used to aid in accident investigations, the recording devices would also add another level of distraction and discomfort for train crews (e.g., audio headsets) and, for the safety purposes of the system to be achieved, the devices would at a minimum have to be operative on each lead locomotive while the train is in motion, require crashworthy data storage modules, and require the availability of an extra headset in the case of an en route failure.

In response to FRA's request for comments on whether to require exterior recording devices, BLET stated that all key locomotive operations, including throttle, braking, locomotive horn/bell, are already captured on the locomotive's event recorder. Further, BLET noted that because grade crossing warning devices are intended to warn motorists, not the train crew, it would be more helpful instead to mount audio recorders at highway-grade crossing signal control boxes. Accordingly, BLET saw no value in requiring exterior locomotive recording devices; however, if FRA were to consider requiring such devices anyway, BLET commented that FRA should consider exterior audio devices that could be engaged or disengaged by selecting from the locomotive's software preferences for the camera. BLET stated the cost to do so would be nominal as it is already an included feature on some locomotives. BLET further indicated that this feature was discussed at RSAC Working Group meetings.

TTD asserted that audio recording devices would have a negative impact on train crews' morale and the labor-management relationship, and could possibly record and lead to the release of private conversations unrelated to safety-sensitive tasks. TTD noted that a substantial amount of information is already recorded or transmitted, or both, via on-board equipment and radio communications, and eventually will be through image recorders. Thus, TTD did not see how audio recording devices

would improve safety and asserted that FRA should not mandate audio recorders in the final rule.

SMART commented that during RSAC Working Group meetings, both railroads and labor organizations expressed unanimous opposition to a locomotive audio recorder requirement. SMART believed employees deserve some privacy protections and concurred with FRA's reasoning in the NPRM that audio recorders should not be required.

In addition to labor organizations, APTA commented that it also opposed requiring locomotive audio recorders. APTA stated that the railroad industry supports most of FRA's NPRM analysis regarding audio recordings, and that the industry believes that locomotive audio recordings are redundant and secondary to both locomotive image recorders and pre-existing communication systems, such as radio. APTA also stated that audio recordings, like video recordings, are not monitored by the railroads in real time, and therefore, have minimal value in preventing accidents.

Notwithstanding APTA's assertion that the industry opposed a locomotive audio recorder requirement, the National Railroad Passenger Corporation (Amtrak) commented that FRA should create an exterior recording device requirement to aid in post-accident investigations because these devices are extremely beneficial in private litigation. Amtrak provided figures on the cost of installing image recording devices for their fleet to be \$10,080 as well as the cost per locomotive of new audio equipment to be \$23,349, as FRA requested. Additionally, in the RIA, FRA estimates a range that starts at \$6,000 for each audio recording device up to a cost of \$23,349. This lower estimate was based on discussions with FRA's subject matter experts and online research.

Amtrak also commented that the benefits provided by locomotive audio recordings would outweigh concerns about the potential loss of personal privacy for locomotive cab occupants, because while operating a locomotive, the use of audio-visual recordings would be a condition of employment applicable under the railroad's enforcement of rules. In addition, Amtrak asserted that the benefits of locomotive audio devices would outweigh the potential for abuse by railroad management because Amtrak has an established company program and process in place providing that the use of audio and visual recordings is for compliance means only.

The NTSB also urged FRA to require both internal and external locomotive audio recorders as part of this final rule.

As noted in the NPRM, the NTSB has conveyed to FRA that to satisfy NTSB Recommendations R-10-01 & -02, FRA would need to include both audio and image recording provisions in this rulemaking.¹⁵ Further, in its submitted comments, the NTSB stated that for more than 10 years, voluntarily-installed image and audio recorders have assisted the NTSB with its investigations. According to the NTSB, the technology is fully developed and mature, and the devices are readily available and are already being manufactured, installed, and used. The NTSB also commented on what it believed to be sufficient technical specifications for locomotive audio recording devices and cited the recording capabilities of locomotive audio recording devices used by Amtrak as a model. The NTSB also stated that because memory storage requirements for audio recordings are significantly less than those for image recordings, additional memory for audio recordings should not be needed. Finally, while recognizing the high levels of background noise inside locomotive cabs from its experience investigating railroad accidents, the NTSB stated it did not believe that headsets or other specialized audio recording equipment, beyond what is currently being used by railroads that have voluntarily installed such devices, will be necessary.

The NTSB cited how important both inward-facing locomotive image and audio recordings were in its investigation of the December 18, 2017, derailment of Amtrak passenger train 501 in DuPont, Washington. According to the NTSB, these internal locomotive audio and visual recordings helped the agency determine that neither personal electronic device use nor brief conversations between the engineer and conductor were causes of the derailment.

While internal locomotive audio recordings were useful in the NTSB's investigation of the Amtrak passenger train 501 accident, NTSB's comment states that it was audio recording devices inside the locomotive along with inward-facing locomotive video recording devices that helped the NTSB make determinations as to what could be excluded as the cause of the 2017 Amtrak accident in Dupont, Washington. Furthermore, the NTSB investigation into this accident is just one specific investigation into one specific railroad accident. FRA did not

¹⁵ National Transportation Safety Board, *Safety Recommendations R-10-01 and R-10-02* (Feb. 23, 2010); available online at: <https://www.ntsb.gov/safety/safety-recs/reclatters/R-10-001-002.pdf>.

find any specific evidence that would lead the agency to believe that internal audio recorders would be useful in all accident investigations.

Wi-Tronix also commented on FRA's decision to not include an audio recorder proposal in the NPRM and agreed with the NTSB that, based upon its incident investigation experience over the years, the availability of audio locomotive recordings has played a critical role in determining the chain of events during an accident investigation and the implementation of the technology is essential in getting the "step-change improvement" in human factor safety that FRA desires. Wi-Tronix also commented on the potential for privacy concerns with audio recordings that were raised by TTD and SMART. Wi-Tronix believes that with current technology, recorded audio information could be sequestered and be made available only to regulators and other officials on a limited basis after an emergency incident. Further, Wi-Tronix stated that artificial intelligence and machine learning could use the audio information for analytics anonymously without personal information included. Wi-Tronix said that the implementation of audio recordings, in conjunction with video recordings, is not a major cost driver for system implementation.

Finally, an anonymous commenter stated that installing inward and outward-facing recording devices could be beneficial when investigating railroad accidents. The commenter expressed hope that these recording devices will decrease the number of railroad related accidents.

After considering all the comments received on whether audio recording devices should be required on lead passenger locomotives, FRA has determined that a requirement for such devices on lead passenger locomotives is not justified. Accordingly, in this final rule, FRA is not adopting a requirement for the installation of audio recording devices on passenger or freight locomotives. FRA does not believe that the potential added utility of audio recordings, in addition to image recordings as well as the data provided by a locomotive's event recorder, outweighs the cost that would result. Indeed, while audio recording devices may provide some additional useful information in certain accident investigation scenarios, the overall usefulness of locomotive audio recordings is diminished by the statutorily mandated requirement of inward- and outward-facing locomotive cameras as well as existing requirements for event recorders on all lead passenger locomotives. Further, as previously

stated, there is no requirement in the FAST Act that passenger or freight locomotives be equipped with either internal or external audio recording devices. Therefore, FRA is allowing railroads to decide whether to equip their locomotives with external and/or internal audio devices.

Passenger locomotive cabs, unlike freight locomotive cabs or even commercial airliner cockpits, are typically occupied by only one crewmember, while additional crewmembers are located in the passenger train consist assisting passengers. As there is usually only one crewmember in the locomotive cab while a passenger train is in motion, it is unclear what information internal locomotive audio recorders would provide that inward-facing locomotive cameras could not. For example, as cited in the NPRM, in both the 2008 Chatsworth Southern California Regional Rail Authority (Metrolink) accident,¹⁶ and the 2015 Philadelphia Amtrak accident,¹⁷ the locomotive engineers operating the trains were the sole occupants of the locomotive cab while the other crewmembers were in the passenger consist. Also, as TTD commented, a substantial amount of information is already recorded via onboard equipment and radio communications. Therefore, other than radio communications with other train crewmembers or the train dispatcher, which are often already recorded, there may not be any other voice communications inside the cab to record.

External locomotive audio recorders are unlikely to provide much additional information in post-accident investigations. As stated by BLET, all key locomotive operations, including throttle, braking, and locomotive horn/bell, are already required to be captured on the locomotive's event recorder. If an accident occurs, this data can be retrieved from the event recorder. Combining the event recorder data with information gained from external locomotive cameras diminishes the need for external audio recording devices. Accordingly, given the information already available to FRA and other investigators from event recorders and locomotive cameras, FRA cannot justify mandating the installation of an external audio recording device at this time.

Moreover, locomotive audio recorders will not greatly increase a passenger railroad's ability to deter railroad safety violations, such as the use of prohibited

personal electronic devices, beyond the deterrence already provided by inward-facing image recorders. Because the locomotive engineer is typically alone in the locomotive cab, it is unlikely that audio recordings will pick up audio information useful to prove that a rail safety violation occurred that could not be determined from video footage. In fact, audio recordings might not pick up anything at all.

Further, FRA shares SMART's and TTD's concern that because train crews might be more likely to congregate in the locomotive cab when not performing their safety-related duties (e.g., sitting in a siding), locomotive audio recorders might be more likely to pick up private conversations between crewmembers than the audio proof of a railroad safety violation. As stated in the NPRM, FRA has concerns that these time periods would likely include personal conversations between employees and might have much more potential for abuse than do inward-facing image recordings. While a commenter suggested that audio recordings might be sequestered in a way that they would only be accessible by regulators and other government officials, like FRA and the NTSB, audio recordings would share the same memory module as image recordings, and FRA anticipates that passenger railroads would want to review them as part of their part 217 operational testing plans.

Finally, based on information provided by the railroad industry, FRA subject matter experts, and online research, FRA estimates that the inclusion of audio recording devices would cost passenger railroads between \$25.2 and \$98.1 million dollars within the first four years of implementation to install on over 4,200 passenger locomotives. Although FRA recognizes that Wi-Tronix commented that the cost of locomotive audio recorders in conjunction with image recording device would be nominal, there may be only a small number of accidents where audio recordings might be beneficial and Wi-Tronix did not provide any data to support its cost assertion.

FRA understands from RSAC Working Group discussions and its own research that the audio recording devices and microphones contained within a locomotive's image recorders have some costs, but railroads indicate a crash-hardened memory module for audio recordings might increase costs of compliance. FRA is also concerned about the background noise levels inside the cabs of certain locomotives and has previously conveyed that concern to the NTSB. Because of the noise, additional equipment may be

¹⁶ See 84 FR 35712, 35716–35717.

¹⁷ *Id.* at 35717.

needed to record crew voice communications so the recordings can accurately be deciphered by railroad managers and accident investigators. This would also be expected to add to the cost of installing such equipment.

However, FRA also disagrees with BLET and SMART, and nothing in this final rule precludes passenger or freight railroads from voluntarily installing and using either internal or external locomotive audio recording devices as part of their operation, if they so choose. The FAST Act provided FRA with discretion whether to include a regulatory requirement for inside-locomotive audio recording devices,¹⁸ and while this rule will not require the installation of inside- or outside-audio recording devices, it will also not preclude the devices. However, if a passenger railroad chooses to install locomotive audio recording devices in their locomotives, then certain requirements from this rule do apply to those devices.

2. Referencing Audio in the Definition of "Recording Device" in Part 229

FRA also received a comment from APTA suggesting that FRA remove any reference to audible sounds from the definition of "recording device" as proposed in the NPRM. For the reasons discussed in Section II.T below, FRA disagrees and intends that audio recordings be subject to the preservation requirements and other relevant requirements of § 229.136.

C. Recording Device Run-Time/Shutoff When Trains Stop Moving

In the NPRM, FRA requested comments on a number of questions regarding whether FRA should set a specific run-time or shutoff requirement for locomotive recording devices. Specifically, FRA requested comment on its proposal to provide passenger railroads the discretion to decide whether locomotive recording devices would continue to record when a locomotive is not in motion, if the railroad retains a recording of the last 12 hours of operation of the locomotive on a memory module compliant with the requirements proposed in § 229.136. FRA also asked for comments on: what safety benefits would result from recordings made when a locomotive is occupied, but not moving; whether a specific run-time or shutoff requirement would present any technical hurdles for the railroads, and if so, the cost of those hurdles (in dollars); the privacy implications of recordings being made during down times when the crew is not

performing safety-related duties; the potential risk of data being overwritten if an accident occurs in a remote location and the device continues to record; and finally, whether passenger railroads should be exempt from any requirement to stop locomotive recording devices from recording when the locomotive is stopped.

FRA received numerous responses to these requests for comments. Most of the comments focused on what the run-time/shutoff standard should be, if any. Both Amtrak and APTA expressed views consistent with FRA's proposed standard that passenger railroads have the discretion to determine their own run-time/shutoff standard for locomotive recording devices. APTA noted that locomotive cabs are workplaces, whether occupied or not, and therefore they should be able to run their locomotive cameras continually. APTA asserted that allowing cameras to run continually would serve as a deterrent against locomotive safety device tampering, assist with potential criminal investigations (such as vandalism), and provide a valuable tool for railroad security. However, APTA stated while its members support the position that railroads should be able to record using their locomotive image recorders when the locomotive is stopped, the decision whether to record while the locomotive is stopped should be left to the individual railroad.

Amtrak's comments were similar to APTA's. Amtrak opposed FRA adopting a stricter standard than that proposed in the NPRM. Amtrak also contended that railroads should be allowed to record after the train has stopped moving (e.g., for security purposes when a locomotive cab is unoccupied, to record mechanical tests such as brake tests and calendar day inspections).

The NTSB commented that FRA should require inward-facing cameras to record whenever a locomotive is powered on, regardless if the locomotive is moving or stationary, and that railroads should not have the discretion to decide to stop recording when a locomotive is not moving. The NTSB stated that safety-sensitive duties frequently occur when locomotives are stationary, and there is no way to limit recordings to only capture safety-related activities. According to the NTSB, by recording anytime the locomotive is powered on, key pre-accident events would be recorded, such as pre-job briefings, and critical post-accident events, such as calling emergency services, would be recorded and available in post-accident analysis. The NTSB also asserted that requiring continuous recording while a

locomotive is powered on would help identify those occasions when an employee tampers with or disables a safety device.

In contrast, BLET, SMART, and TTD disagreed with the aforementioned comments as well as FRA's proposal in the NPRM to provide passenger railroads maximum flexibility in determining the run-time/shutoff time for their recording devices. BLET commented that, regardless of whether the recorders are image or audio recorders, they should be shut off and no longer recording when the train's motion has stopped and the brakes are applied. According to BLET, it would be unacceptable if the cameras can still run when a locomotive is stopped and everything over the course of a crew's duty tour would be under analysis by the railroad.

Further, BLET stated that the time when a train has stopped moving is the only time that a crew has available to eat, use the bathroom facilities, or just relax, noting some railroads permit and even encourage napping to mitigate employee fatigue. BLET claimed there are numerous studies that prove if an individual is recorded on camera continually it will increase the individual's stress level, which thereby increases the individual's fatigue. BLET also pointed out that on many occasions, a train crew may have expired under the hours of service laws and simply be waiting to be relieved. BLET asserted that no safety benefits would result from filming and recording these types of non-operational activities.

BLET also expressed concern for train crewmembers' privacy if inward-facing cameras record when no safety-related duties are being performed. BLET commented that cameras could record employees changing their clothing or needing to express breast milk, which BLET believed cannot be safely and perhaps lawfully done in the sanitary compartment.

Finally, BLET asserted that FRA should not only consider a regulatory restriction on the run-time/shutoff for locomotive recording devices but should also address use of the cameras for monitoring employees. Specifically, BLET commented that some railroads have claimed the technological capacity to view the inside of a locomotive cab regardless of whether the camera's output is being recorded. Therefore, according to BLET, not only should railroads be prohibited from recording when a locomotive is stopped, but railroads should also be prohibited from surveilling their employees when a locomotive is stopped and the cameras

¹⁸ See 49 U.S.C. 20168(e)(1)(A).

should be deactivated when a locomotive is stopped.

SMART and TTD suggested a slightly different standard than that proposed by BLET in that FRA should require railroads to shut off their inward-facing cameras five minutes after a train has stopped. TTD asserted that a five-minute window of additional recording after the train has stopped moving would allow FRA the necessary time to gather post-accident or -incident investigation information, without infringing on the crew's privacy. TTD stated that, in contrast, the standard proposed in the NPRM would allow the railroads to record at all times, even when the train is stopped and the crew is not performing any safety-sensitive duties. TTD asserted that there is no value to recording when trains are stopped, such as at sidings, which occurs with some frequency. Further, TTD agreed with BLET that operating a train is a fatiguing job and that constant filming of train crews will increase tension, and according to SMART, likely also result in "unsafe practices."

SMART echoed TTD's position that inward-facing cameras should not record when trains are stopped and crews are not performing safety-sensitive activities. Like TTD, SMART pointed out that crews often sit in a siding or at a signal for hours with no safety-related duties being performed. SMART also stated that requiring inward-facing locomotive cameras to stop recording five minutes after a train stops would protect against any personal harassment from the unnecessary recording of personal, but not safety-sensitive information.

However, while both TTD and SMART believed a strict five-minute shutoff standard after a train has stopped moving is necessary for inward-facing image recorders, both organizations specifically stated they did not object to a less prescriptive run-off/shutdown requirement for outward-facing cameras. In fact, they stated that the outward-facing cameras would provide the security benefits cited by APTA and Amtrak, and protect the railroad by helping deter vandalism, theft, and other criminal activities.

After consideration of all comments received on this issue, in this final rule, FRA is adopting the standard it proposed in the NPRM. FRA will not prescribe a mandated run-time/shutoff requirement for passenger locomotive recording devices. As will be discussed in greater detail below in Section II.C, as long as the locomotive's required inward- and outward-facing cameras are recording anytime the locomotive is in motion and the passenger railroad is

complying with all other requirements of the final rule described below (e.g., no video recording in the locomotive's sanitation compartment), the railroad has the discretion to continue recording images, and audio if installed. FRA concluded that, as APTA and Amtrak pointed out in their comments, allowing railroads to record both inside and outside of the locomotive cab when the locomotive is not in motion can serve legitimate safety functions, such as preventing tampering, assisting with criminal investigations (such as vandalism and trespassing), and be an overall useful tool for railroad security. In addition, FRA agrees with NTSB's point that recording when a locomotive is powered on may have potential informational value in post-accident investigations.

As discussed in the NPRM, the railroad industry is highly regulated, and there are already a large number of Federal statutes and regulations governing railroad employees' performance of safety-related duties when they occupy the cab of a lead locomotive.¹⁹ In fact, the Supreme Court has recognized that "the expectations of privacy of covered employees [here, train crewmembers] are diminished by reason of their participation in an industry that is regulated pervasively to ensure safety. . . ." ²⁰ A locomotive is a shared work space between various railroad employees. During one railroad employee's tour of duty, railroad supervisors, FRA inspectors, and other authorized individuals may access the cab of the locomotive and observe the employee's actions and communications in the cab, at any time, without providing any notice. In fact, the general public is often able to view train crewmembers occupying the locomotive cab and certain of their actions through the passenger locomotive's windows when the locomotive is located near a railroad right-of-way or a highway-rail grade crossing and also in certain cab control car configurations or at certain station platforms. Therefore, as passenger train crews can be monitored or frequently observed in locomotive cabs even without recording devices, they have no expectation of privacy in

¹⁹ For example, railroad employees who operate trains within the United States are subject to drug and alcohol testing (both random and for cause) (49 CFR part 219), operational testing (e.g., 49 CFR parts 217, 218, 220, 240, 242), hours of service laws (see 49 U.S.C. ch. 211, 49 CFR part 228), and regulations governing the use of personal electronic devices (49 CFR part 220), among many other requirements.

²⁰ *Skinner v. Railway Labor Executives Association*, 489 U.S. 602, 627 (Mar. 21, 1989).

the locomotive cab, whether or not the locomotive is moving.

FRA also requested and received comments on the potential risk of overwriting valuable recorded data if an accident occurs in a remote location and a locomotive's recording device(s) continue to record after the accident has occurred and the recordings before and during the accident are recorded over. Both the NTSB and APTA submitted comments on this issue.

The NTSB indicated it has found that, in most major accidents, the locomotive loses power, which stops all recording devices and negates the risk of overwriting accident data. However, the NTSB commented that railroads should put procedures in place to preserve recordings in the event of a less severe accident in a remote location where the locomotive does not lose power and the footage could be overwritten.

APTA commented that concerns about passenger trains might be misplaced and pointed out that instead of passenger trains, freight trains are more likely to pass through or stop in remote areas or areas that are potentially harder to access, and have longer one-direction trip-duty times than commuter and, in some cases, intercity passenger trains. APTA stated that commuter trains trip lengths are shorter, and it is not uncommon for a train to travel in one direction leading with a conventional locomotive and then do a reverse trip in the other direction leading with the train's cab car. APTA also maintained that crew on-duty times for commuter and intercity passenger routes are generally shorter and scheduled to minimize any jobs approaching 12 hours on duty so that crews have additional rest before their next trip, and that crews may even change train consists. APTA believed these elements contribute towards reducing the potential for critical video being overwritten in an accident.

In addition, the NTSB commented that FRA should address the issue of buffering in this final rule to ensure that all critical events occurring before an accident occurs are recorded. The NTSB stated that frequently saving data to permanent storage from temporary memory—that is, buffering—will help prevent the loss of audio and images due to accidents and power disruptions, as it has experienced varied success with recording devices capturing the time period before an accident. The NTSB noted that, in the February 8, 2018, CSX Transportation accident in Cayce, South Carolina, the outward-facing image and audio recorder did not record critical events before the accident; instead, the audio stopped

recording a few minutes before the accident, and the image recording stopped about a minute before the accident, without recording the misaligned switch that derailed the train. Conversely, the NTSB cited the December 18, 2017, Amtrak accident near DuPont, Washington, where the inward- and outward-facing image and audio recordings did capture critical events up to the time of derailment.

After carefully considering both NTSB's and APTA's comments, FRA has determined it would be premature to create a regulatory requirement for passenger railroads addressing the potential for data being overwritten if an accident occurs in a remote location where there is no loss of power to the recording device, but the memory module is not immediately available. Although FRA agrees that passenger railroads should consider the possibility that commuter or intercity passenger trains could have an accident in a location where the locomotive does not lose power, the footage in the memory module may not be readily retrieved, and the footage could be overwritten, FRA has found no evidence of such a passenger train accident occurring. FRA also agrees with APTA's comment that, overall, passenger trains are far less likely to pass through or stop in remote areas when compared to freight trains. Therefore, lacking evidence of such a passenger train accident or incident occurring, and considering the limited likelihood of such a situation occurring in the future, FRA declines to adopt a regulatory provision specific to the risk of data being overwritten in such a scenario.

D. Exclusion of Existing Installed or Ordered Equipment

FRA received numerous comments stating that locomotive image recording devices previously installed or ordered before the publication date of the final rule should be excluded from complying with the final rule's requirements. For reasons discussed below, FRA disagrees with the comments and will not allow previously installed or ordered locomotive image recording devices or voluntarily installed audio recording devices to be excluded from this final rule's coverage. Instead, as proposed in the NPRM, this final rule provides passenger railroads with a four-year implementation period within which all of their lead locomotives must be brought into compliance with the rule's requirements.

APTA commented that FRA should allow exclusions for recording devices that have been installed or are in the

process of being installed prior to the issuance of the final rule. APTA asserted that if FRA does not exclude these devices, there is a strong possibility that railroads that were early adopters of locomotive recording device technology will be financially penalized because the proposed requirements for image recorders would be too prescriptive and older locomotive recording devices could not comply. APTA also maintained that the cost to retrofit existing lead locomotives would be significant and could delay the availability of data for use by the passenger railroads as well as FRA and the NTSB for post-accident investigations. APTA stated that 76 percent of passenger locomotives already have image recording devices installed and that 93 percent of passenger railroads have installed image recording devices in all of their vehicles, or are in the process of doing so, and that "a few large railroads" equipped, or partially equipped, their fleets with recording devices within the last year. Given APTA's assumption that locomotive image recording systems have a life span of eight years, APTA believed that these railroads will lose most of the full life-cycle of the recording devices if FRA does not include an exclusion clause in this final rule.

AAR also agreed that FRA should include an exclusion provision to protect early adopters of this technology. According to AAR, during the 2014 RSAC Working Group meetings FRA proposed that recording systems installed on locomotives prior to the rule's effective date would be considered compliant for ten years from the final rule's publication date, with the exception that memory modules would be required to meet the crashworthiness requirements within three years of publication. AAR therefore suggested that recording systems installed prior to the final rule's publication date be considered compliant until ten years from that date, whether or not all of the functional requirements of the rule were met by the already-installed system.

The North County Transit District (NCTD), which operates the COASTER commuter rail service in Northern San Diego County, California, suggested that the final rule should exclude locomotive recording devices that were installed prior to the effective date of the final rule and do not meet the crashworthy memory module requirements. NCTD stated it began installing inward- and outward-facing cameras with audio recorders in 2012 and had just completed a global replacement of

cameras and recording devices on its entire locomotive and cab car fleet.

Finally, the Commuter Rail Division of the Illinois Regional Transportation Authority (Metra) also agreed with many of the same comments that passenger railroads have already begun to utilize recording equipment and, therefore, FRA should allow existing equipment to continue to be used to avoid punishing early adopters of the technology.

Although FRA appreciates the concerns raised by the commenters, FRA does not believe it in the public's interest or the interest of rail safety to provide an exception from the final rule's requirements for locomotive image recorders installed prior to the rule's publication date. Older cameras that do not meet the final rule's requirements would likely not provide the benefits (deterrence and accident investigation) that the rule seeks to provide. As discussed above, the Cayce accident is a prime example of how accident investigations could be adversely affected by use of older camera systems, because external locomotive image (and audio) data was lost in the accident. Under the requirements of this final rule, locomotive recordings must now be stored on a certified crashworthy memory module as required by the FAST Act, or an alternative remote storage system approved by FRA. If FRA were to exempt older image recording systems from the requirements of this final rule, it would increase the likelihood of more vital accident data being lost by use of non-compliant systems. Four years is an adequate time for passenger railroads with installed or currently ordered locomotive recording systems to get remaining value out of the recording systems without unduly putting value maximization of current locomotive recording systems above passenger rail safety. In addition, the NTSB has supported FRA's four-year implementation period as encouraging prompt implementation of the final rule's requirements. As stated above and in the NTSB's comment, the NTSB's report from the DuPont accident showed there is a clear investigative benefit to the information obtained from locomotive recording devices. According to the NTSB, "any further delays beyond the proposed 4-year deadline would be unacceptable," given NTSB issued Safety Recommendation R-10-01 in 2010.

Passenger locomotive image recorders that do not meet the final rule's requirements might not be sufficient to identify railroad safety violations as well as provide adequate data for post-

accident/incident analysis. Moreover, even if FRA were to allow previously installed or ordered equipment to be excluded from this final rule's requirements, retrofitting the vast majority of, if not all, passenger locomotives would still be necessary as the Statute requires locomotive recorder data to be stored on crashworthy memory modules and very few, if any, passenger railroads currently store their image recordings on such modules. As discussed in the Section II.K below, a four-year implementation period is an adequate timeframe for passenger railroads to comply with the final rule. Passenger railroads will have four years to stagger any modifications or retrofits that are necessary to bring their locomotives' recording systems into compliance with the final rule.

E. Certified Crashworthy Event Recorder Memory Modules

1. Necessity of Crashworthy Memory Modules

FRA received numerous comments about the proposed requirement to store locomotive recorder data on a certified crashworthy event recorder memory module and potential alternatives to meet an appropriate crashworthiness level to protect stored locomotive image recording system data. APTA stated that a crashworthy memory module is unnecessary due to the installation of positive train control (PTC) on passenger railroads, which will eliminate most of the accidents that FRA cited in the NPRM, and that passenger railroads believe crashworthy memory retention could be achieved by simply positioning the recording devices in an area to minimize impact forces. However, APTA supported FRA's suggestion to provide waivers for the memory module's crashworthiness when the recording is transmitted to a remote location, stating the technology surrounding image recordings is advancing more quickly than the rulemaking process, and encouraged FRA to consider waivers for remote storage options in lieu of crashworthiness standards.

Wi-Tronix raised concerns that some of the proposed requirements for inward- and outward-facing cameras, such as the 12 hours of required storage together with the crashworthy memory module requirement, added unnecessary costs to railroads without a justification. Understanding the final rule's need for data preservation, Wi-Tronix asserted there are other technical approaches that could accomplish the same goals on a more cost-effective basis, stating that cloud solutions

accomplish the same data retention and have the potential to be more economical while creating other value in the process.

Conversely, both the NTSB and SMART supported the proposed crashworthy memory module requirement. In addition, BLET commented that the paramount consideration and goal of the final rule should be a uniformity of standards throughout the whole railroad industry, whether locomotive recording devices be required by the Statute or voluntarily installed. Therefore, BLET believed it makes logical and economic sense to store all forms of recorder operational data (*e.g.*, event recorder data, safety-critical PTC data, and audio/visual recording data) in a single storage unit that meets the appropriate crashworthiness standards in appendix D to part 229. BLET also stated that FRA should be focused on the performance and survivability of crashworthiness options, and not necessarily the cost.

2. Potential Exemptions From the Crashworthy Memory Module Requirements

FRA also received comments about exempting from the crashworthy memory module requirement those systems that can store locomotive recorder data safely and remotely. As previously stated, APTA commented that FRA should avoid mandating onboard locomotive storage of data in favor of more flexible storage options for passenger railroads, including cloud or remote storage. Hitachi, Ltd. (Hitachi) agreed with APTA that remote storage should be allowed and recommended that the rule avoid mandating onboard crashworthy memory storage for locomotive recording data. Hitachi stated that image processing and data communications technology has matured in transmitting real-time images to be stored and analyzed remotely at centralized locations, and thus the final rule should avoid mandating onboard locomotive storage in favor of remote storage options that make more economic sense for the railroad.

The NTSB, however, disagreed with exempting locomotive recorders from crashworthiness requirements even when the recording system is designed to immediately transmit and store data at a remote location. The NTSB asserted the exemption would risk the loss of data when an accident occurs in an area where data cannot be reliably transmitted, such as in tunnels or remote regions. BLET also commented that wireless transmission and storage of locomotive audio or image data should

be prohibited to prevent private, personal data from being hacked.

In response to these comments, FRA emphasizes that the requirements for crash and fire protection of in-cab recordings—*i.e.*, that each inward- and outward-facing image recording device have crash and fire protections for any in-cab image recordings that are stored only within a lead locomotive—are mandated by the Statute.²¹ To implement this statutory requirement, in § 229.136(a)(5), FRA is requiring that any locomotive recording device data (including any audio recorder data) stored only within the lead locomotive be recorded on a memory module that meets the established requirements for a certified crashworthy event recorder memory module described in appendix D to part 229, which includes protection against fire. If a passenger railroad chooses to install a locomotive image recording device that does not store the recorded data only within the lead locomotive, but instead stores the data remotely using cloud storage or other remote storage alternative, the railroad must state so in its written description of the technical aspects of the locomotive image recording system submitted to FRA as part of the system's approval process required by § 229.136(g) of this final rule. FRA makes clear that use of a recording device system relying exclusively on cloud storage or other remote storage alternative would not require a waiver under 49 CFR part 211, as indicated in the NPRM, but instead may be authorized through the approval process under § 229.136(g).

For FRA to approve use of a locomotive recording device system that only uses remote storage for its recorded data, the passenger railroad must show conclusively how the remote storage system provides at least equivalent data protections to those provided by use of a certified crashworthy memory module under appendix D to part 229. Specifically, the railroad must describe how all of the data will be reliably and securely transferred to the cloud or other remote storage location and how that data will be reliably and securely stored and retrievable. The railroad must also show how the reliable and secure transfer of all locomotive image recording device data to a remote storage location will occur under a variety of situations, including situations involving accidents and/or incidents (especially in outlying or remote areas), system failures, or other similar contingencies. FRA will not approve the use of any locomotive

²¹ 49 U.S.C. 20168(b)(2).

image recording system if the railroad does not clearly demonstrate both that the data cannot be lost due to its transfer from the locomotive image recording device to the remote storage location and cannot be lost or corrupted during storage and therefore irretrievable. This allows passenger railroads to enjoy the benefits of remote storage of data for these recording devices while preventing the potential for lost data, which could prove critical in a post-accident investigation, and ensuring that the transfer of data to the remote storage location is secure.

Freight railroads that have voluntarily installed or are planning to voluntarily install inward- or outward-facing recording devices on their locomotives are not required to store the data on a certified crashworthy event recorder memory module. However, FRA recommends that if a freight railroad chooses to use a memory module, it should mount and position the module in such a way as to provide the module with maximum protection.

3. Need for Stronger Memory Module Requirements

FRA understands the NTSB's preference for stricter recorder survivability standards. The NTSB has recommended FRA require event recorder data to be also recorded in another location remote from the lead locomotive(s) to minimize the likelihood of data destruction in an accident, as has occurred in certain accidents (NTSB Safety Recommendation R-13-22).²² However, the standards in appendix D to part 229 require a crashworthy memory module, which is designated to withstand the conditions an event recorder may encounter, including accident conditions. A new, more stringent standard that would prevent the destruction of data in every passenger railroad accident scenario is likely not cost-beneficial, and is also likely unnecessary given the implementation of PTC systems.

As discussed in the NPRM, the railroad accidents that led NTSB to issue recommendations related to locomotive image and audio recording devices were caused by human factors—and nearly all were PTC-preventable. Thus, given the full implementation of PTC systems on intercity passenger and commuter railroad main lines, the likelihood of similar accidents occurring should be greatly reduced, if not

eliminated. In turn, the need should diminish for more stringent crashworthy memory module requirements to preserve image and audio recordings for use to investigate accidents resulting from human factor causes on main track.

Memory modules are acceptable that meet the specified performance criteria in either Table 1 or Table 2 of section C, appendix D to part 229. As FRA discussed in the rulemaking promulgating the crashworthy memory module standards, each set of criteria in Tables 1 and 2 is a performance standard, and FRA has not included any specific test procedures to achieve the required level of performance. FRA did not believe it necessary to include specific testing criteria in the regulation, as the rail industry and equipment manufacturers are in the best position to determine the exact way they will test for the specified performance parameters.²³ FRA's position remains the same today and notes that not requiring specific test procedures also accommodates adoption of any future testing methods that are developed.

4. Storing Audio Recordings on the Crashworthy Memory Module

APTA commented that it was opposed to requiring recordings from voluntarily installed recording devices to be stored on a certified crashworthy memory module under part 229, appendix D. FRA does not agree. Although this final rule does not require passenger railroads to install locomotive audio recorders, because installing such devices is not required by the FAST Act, if passenger railroads voluntarily install audio recording devices, the data recorded must be maintained on a crashworthy memory module to ensure the data is available for use by FRA as well as other Federal agencies (and railroads themselves) to conduct effective post-accident/incident investigations and more accurately determine the causes of accidents/incidents. Accordingly, § 229.136(a)(5) requires any passenger locomotive recording device data, whether image or audio data, to be recorded on a certified crashworthy memory module as described in part 229, appendix D, or on an alternative, remote storage system, as approved by FRA. For further discussion on this final rule's accident/incident preservation requirements for locomotive recording devices, please see the discussion under § 229.136(f) in this rule's Section-by-Section Analysis.

F. Outward-Facing Locomotive Image Recording Systems and Devices

1. Placement of Outward-Facing Locomotive Image Recording Devices

APTA expressed concern about the proposal to require aligning an outward-facing locomotive image recording device to point parallel to the centerline of tangent track on which the lead locomotive is traveling. APTA believed the proposal would require mounting the camera within the gauge of the track and stated that, because many locomotive designs have center collision posts or center doors, the cameras may need to be mounted on the side of the locomotive and be aimed towards the center of the track. APTA therefore requested the rule be clarified accordingly to permit such camera placement.

However, the rule text needs no such clarification because this rule does not require outward-facing image recording devices to be mounted on the centerline of a passenger locomotive. FRA recognizes that cab car and multiple-unit (MU) passenger locomotives have features that may inhibit the placement of cameras on the centerline, and FRA never intended to require cameras to be mounted on the centerline. The rule requires cameras to be aimed “parallel” to the centerline of tangent track, wherever the cameras may be placed on the leading end of the locomotive, and FRA is adopting the proposed rule text without change.

2. Requirements for Outward-Facing Locomotive Image Recorders Are Too Prescriptive

APTA commented that requiring outward-facing locomotive image recorders to be able to distinguish the signal aspects displayed by wayside signals, as proposed in the NPRM, would be too prescriptive and overcomplicate the outward-facing camera system. APTA preferred a more performance-based standard, and added there are multiple environmental factors that affect the image quality of outward-facing camera footage that are not within the railroad's control. APTA also stated that the proposed standard to record at 15 frames per second (fps) and the proposed resolution requirement are vague and would make design compliance subject to many factors that would increase costs. APTA therefore offered alternative language allowing the railroads to determine the frame rate and resolution for their locomotives' outward-facing cameras. Similarly, Wi-Tronix asserted that basing the resolution requirement for outward-facing cameras upon whether a system

²² National Transportation Safety Board, *Safety Recommendation R-13-22* (Aug. 14, 2013); available online at: <https://www.ntsb.gov/safety/safety-recs/reletters/R-13-018-023.pdf>.

²³ 69 FR 39785 (June 30, 2004).

could determine switch points from a 50-foot distance is too subjective, and instead suggested that an objective, technical resolution specification should be used and implemented. AAR also stated that FRA should remove prescriptive provisions, such as the NPRM's proposed requirements for outward-facing recording devices.

TTD commented that it did not object to less prescriptive requirements on outward-facing cameras for the purposes of preventing vandalism, theft, or other criminal activity. However, BLET supported more prescriptive requirements for outward-facing locomotive image recording devices, commenting that it favored requiring locomotive recordings to have an accurate date/time stamp calibrated to coincide with the date/time stamp on the lead locomotive's event recorder. BLET stated that investigative efforts would be hampered, instead of facilitated, if such a requirement were not adopted.

Finally, Metra commented that FRA should permit flexibility in the selection and implementing of railroads' locomotive image and audio recording systems. Specifically, Metra stated that if the systems meet the technical requirements, railroads should have leeway to determine the type and model of recording system used and what sound audio recording systems will capture (e.g., cab versus exterior bell and horn).

After consideration of all comments received, FRA is adopting the requirements for outward-facing locomotive image recording devices in § 229.136(b)(1) as proposed in the NPRM. FRA understands concerns that certain requirements for outward-facing cameras are prescriptive; however, this was FRA's intention. As compared to the defined space inside a locomotive cab, the area outside and ahead of a locomotive is vast and unbounded. Consequently, establishing certain, more prescriptive, uniform performance parameters helps ensure that image recordings conform to minimum standards necessary for reliable, post-accident/incident investigation. A more performance-based approach risks potential variances and omission of necessary data. However, FRA makes clear that these standards are minimum standards, and passenger railroads do have considerable discretion as to how they want their outward-facing locomotive cameras to operate and record data.

G. Inward-Facing Locomotive Image Recording Systems and Devices

1. Inward-Facing Recording Devices as a Tool To Detect Fatigue

In the NPRM, FRA discussed the possibility of inward-facing image recorders being a tool to identify fatigue, prevent fatigue-related accidents/incidents, and identify when fatigue has been a relevant factor in an accident/incident. However, APTA commented that relying on image data as a fatigue-mitigation tool has limited application, stating it is unclear what criteria the industry would use to determine when an employee is fatigued and that such analysis on the part of the railroad could be subjective.

This final rule requires the inward-facing image recording systems to have sufficient resolution only "to record crewmember actions"; FRA has not adopted the proposed text specifically addressing crewmember incapacitation. FRA is still hopeful that inward-facing locomotive cameras can be helpful devices to determine whether fatigue may have caused or contributed to an accident or incident. However, FRA agrees that requiring passenger railroad to make a determination that their inward-facing locomotive image recording systems have sufficient resolution to identify whether a crewmember is physically incapacitated is too subjective a standard.

2. Locomotive Recording Devices and Real-Time Monitoring

APTA sought clarification whether the proposal implied that passenger railroads must conduct real-time monitoring of their locomotive cabs. According to APTA, the passenger railroad industry does not support real-time monitoring and, if remote monitoring is added as a requirement, FRA would need to significantly adjust its cost burden estimates to account for staffing and other increased costs of such monitoring. As discussed in the Section-by-Section analysis below, FRA has not adopted the proposed language that APTA believed may imply a requirement to engage in real-time monitoring of the train crew. FRA intended no such requirement.

3. Inward-Facing Recording Device Coverage of the Locomotive Cab

APTA suggested changes to the proposal in § 229.136(c)(1) that the inward-facing recording system be positioned to provide "complete coverage of all areas of the controlling locomotive cab where a crewmember typically may be positioned." APTA commented that the proposal was too

prescriptive, stating that multiple designs of locomotives would require various solutions and therefore the devices should be positioned to provide coverage of areas of the controlling locomotive cab as defined by the operating railroad.

Similarly, SMART disagreed with requiring the inward-facing image recorders to provide "complete" coverage of the locomotive cab, and instead suggested that the standard should provide for "overall" coverage. SMART acknowledged that an inward-facing locomotive image recording device must be positioned to provide coverage of the controlling locomotive, but believed requiring "complete" coverage might be overly broad and imply coverage to include every minute area of the locomotive.

In general, the requirement to provide "complete" coverage is intended to ensure that the recording system not omit footage of crewmember actions in any part of the locomotive cab that might be vital in post-accident/incident investigations.²⁴ Allowing the operating railroad to define the areas of the lead locomotive to be covered by the inward-facing recording system or allowing only "overall" coverage may lead to a lack of a uniform minimum amount of coverage that risks omitting critical data. Therefore, FRA is still requiring that inward-facing image recording systems provide "complete" coverage of all areas of the controlling locomotive cab but puts some limits on the requirement. "Complete" coverage only needs to be "of all areas of the lead locomotive cab where a crewmember typically may be positioned, including complete coverage of the instruments and controls required to operate the controlling locomotive in normal use." This clause ensures that passenger railroads will not be found in violation of the standard if their inward-facing image recording system does not cover mostly inaccessible corners of the locomotives where activities necessary to operate the locomotive would not occur.

4. Recording in Low-Light Conditions

APTA opposed including the language in proposed paragraph § 229.136(c)(1)(ii) (now in (c)(1)(iii)) requiring recording systems to automatically switch to infrared or another operating mode that enables the recording to have sufficient clarity when ambient light levels drop too low for

²⁴ FRA has exempted the locomotive's sanitation compartment in paragraph (c)(3), because the privacy needs of the train crew outweigh, among other things, the potential that actions occurring in the sanitation compartment will cause or contribute to an accident/incident.

normal operation. Instead of what it termed a too prescriptive and one-size-fits-all approach, APTA believed the requirement should provide that the camera system be capable of using ambient light in the cab during all times in passenger service. Conversely, the NTSB agreed with FRA's proposal.

FRA disagrees that the proposed requirement for a recording system to switch to another operating mode to enable effective recording when ambient light levels are too low for normal operation is overly prescriptive. As proposed, the camera system may use any operating mode that enables the passenger railroad to record with sufficient clarity all areas of the lead locomotive cab where a crewmember typically may be positioned. Infrared technology is one way of meeting this requirement, but the use of infrared technology is not required. This is a key requirement, however, to ensure that regardless of the technology used to record inside the locomotive cab at nighttime or in other periods of low ambient light (e.g., in tunnels), the inward-facing cameras must still be capable of recording crewmember actions with sufficient clarity. Accordingly, FRA is adopting this requirement as proposed in the NPRM.

In addition, BLET commented that locomotive technologies are already excessively distracting to crewmembers, there is no need for additional distractions, and cameras or independent light sources should never emit any light that distracts the crew from safely performing their duties or interferes with the crew's vision outside the locomotive window. APTA also stated that a crew should always be able to use the locomotive's sun visor to block direct sunlight that could affect the crew's sight and the identification of signals or other objects outside of the locomotive cab windows.

Existing FRA regulations provide that any illumination in low-light conditions cannot interfere with a crew's vision (49 CFR 229.127(a)), and the placement of image recording devices cannot obstruct a crew's view of the right-of-way from its normal positions in the cab (49 CFR 229.119(b)). The use of infrared technology itself is not a distraction to crewmembers and should be installed on a locomotive so it does not interfere with the ability of crewmembers to safely perform their duties. In addition, although FRA does agree that train crews should be able to use the locomotive's sun visor to block direct sunlight that could affect the crews' vision, FRA cautions railroads to not place the inward-facing cameras in such

a way that they can be blocked by the train crew's use of the locomotive visor.

5. Frame Rate for Inward-Facing Recording Devices

APTA commented that it supported the proposed standard to require inward-facing recording devices to record at a frame rate of at least 5 fps. In contrast, BLET commented that 5 fps could be too low a frame rate for use during accident reconstruction if the pictures are not fluid enough to capture action as it happens at the speed it happens. Although BLET understood that allowing inward-facing image recorders to record at a lower frame rate enabled passenger railroads to store more image data at a lower expense, BLET was concerned that the frame rate could create synchronization inaccuracies when the video and audio are captured or played back at different rates. Therefore, BLET stressed that the final rule should specify a frame rate that will prevent these types of inaccuracies.

The NTSB agreed with BLET that a recording rate of 5 fps was not sufficient for inward-facing image recorders. According to the NTSB, because locomotive operating compartments contain numerous indicator lights and displays, cameras recording at 5 fps may not adequately capture possible intermittent warnings or indicator lights. The NTSB stated that it was not aware of any memory limitations that would necessitate such a low frame rate and, instead, recommended at least a 10-fps recording rate for inward-facing image recorders.

FRA understands the concerns raised by BLET and the NTSB. However, FRA is adopting 5 fps as the minimum standard to provide passenger railroads maximum flexibility to comply with the requirements of this final rule. As previously discussed in the NPRM as well as below, a rate of 5 fps is APTA's recommended practice for the selection of recording systems for use in transit-related closed circuit television recording systems and in low-traffic areas or areas where only walking-pace motion is likely (such as passenger areas). Moreover, this frame rate is only a minimum standard. For instance, FRA expects that some passenger railroads may install inward-facing recording systems with a higher frame rate to enhance the use of the devices for operational testing. In addition, under paragraph § 229.136(g), discussed below in the Section-by-Section Analysis, passenger railroads must provide a written description of the technical aspects of any locomotive image recording system installed to comply

with this section. Under § 229.136(c)(1)(i), FRA will not approve an image recording system that does not have "sufficient resolution to record crewmember actions," even if the system records at a minimum frame rate of 5 fps. As a result, recording systems that cannot accurately provide information or sufficiently record what is occurring within the locomotive cab will not be approved prior to installation.

6. Prohibition on Recording Activities Within a Locomotive's Sanitation Compartment

BLET and SMART both supported the proposed requirement that inward-facing locomotive cameras may not record any activity within a locomotive's sanitation compartment as defined in § 229.5, and that no image recording device be installed in a location where the device could record activities within the locomotive's sanitation compartment. Although the Supreme Court has ruled that a locomotive is a workplace and therefore employees have no expectation of privacy,²⁵ train crewmembers have an expectation that their actions will not be recorded on the locomotive's inward-facing recording device(s) within the passenger train's sanitation compartment. FRA is adopting the proposed prohibition on recording the sanitation compartment in the final rule without substantive change.²⁶

H. Notice Provided When Locomotive Recording Devices Are Present

FRA received several comments in response to what, if any, notice passenger railroad crewmembers should receive that locomotive recording devices are present in the locomotive cab. APTA commented that its member passenger railroads have already addressed this issue by providing information using operational notices to affected employees. APTA also added, as discussed above, that courts, including the Supreme Court, have ruled that a locomotive is a workplace and employees have no expectation of privacy within it. In contrast to APTA's comment, Amtrak stated that providing notice by Form FRA F 6180-49A alone, as proposed in the NPRM, was inadequate because it could in practice limit who sees the information. Instead, Amtrak recommended that FRA require signage alerting the crew that audio-visual recording devices are present. SMART agreed with Amtrak's comment

²⁵ *Skinner v. Railway Labor Executives Association*, 489 U.S. at 627.

²⁶ See 49 CFR 229.136(c)(2) of this final rule.

that signage should be required and that there should also be a visible light on the recording device that indicates to crewmembers when the device is in operation.

Because as noted above, crewmembers have no expectation of privacy in a locomotive cab, excluding the sanitation compartment, FRA has concluded that although it proposed to provide notice of recording devices to crewmembers via a notation on Form F 6180-49A (Locomotive Inspection and Repair Record), such notice is not required as a matter of privacy concerns. Therefore, FRA will not require railroads to post signage alerting crewmembers that audio-visual recording devices are present.

However, the value of requiring the presence of a locomotive recording device to be noted on a locomotive inspection and repair record, similar to § 229.135(a)'s requirement for locomotive event recorders, is to ensure that the device is inspected and in proper operating condition as this rule requires. In this regard, as discussed below in Section II.I.3, when a railroad removes a locomotive image recording device from service, a qualified person must record the date the device was removed from service on Form FRA F 6180-49AP (Passenger Locomotive Inspection and Repair Record). This requirement varies slightly from the requirement proposed in the NPRM, where FRA proposed that the notation indicating a locomotive image recording device has been removed from service be made under the REMARKS section of Form F 6180-49A. This is no longer the case. Instead, FRA has created a new form, Form F 6180-49AP, specifically for passenger locomotives.²⁷ It is in the REMARKS section of new Form F 6180-49AP that a qualified person will note the date when a locomotive image recording device is removed from service.

As discussed below in the section-by-section analysis for new § 229.22, Passenger locomotive inspection and repair record, Form F 6180-49AP will serve as the new counterpart to Form F 6180-49A, and will include a designated row for entering information about annual testing of locomotive image recording devices required under § 229.136, consistent with the designated row on Form F 6180-49A (as well as new Form F 6180-49AP) for entering information about required locomotive event recorder testing. FRA makes clear that this new form will in

no way affect use of the F 6180-49A form by locomotives in freight or switching service, which are not subject to the requirements of this rule, nor will it affect use of the F 6180-49A form by passenger locomotives that are not used as the lead locomotives in commuter or intercity passenger train service.

Further, FRA understands and does not dispute the legal precedent raised by APTA that locomotives are highly regulated workplaces, and employees have no expectation of privacy while performing, or ready to perform, operating duties within a locomotive. The only area where train crews do have an expectation of privacy is within a locomotive's sanitation compartment, treatment of which is discussed above in Section II.G.

I. Repairing, Replacing, or Removing Locomotive Image Recording Devices From Service

1. Practicableness of the Standard

FRA received several comments on the appropriateness of the standard in proposed § 229.136(i) that would require inward- and outward-facing locomotive image recording devices to be repaired or replaced at the next calendar day inspection or be removed from service. Many commenters claimed the standard was too burdensome and should be revised. APTA asserted that requiring these systems to be repaired or replaced by the next calendar day inspection is impractical, stating that locomotive image recording systems can fail for many different reasons, and repairs can sometimes take several days. According to APTA, the passenger railroad industry has limited fleet availability and restricting locomotives or trainsets due to locomotive image recording system failures alone could have a substantial impact on dispatching trains, potentially taking an entire trainset out of service when the cars are semi-permanently coupled. APTA contended that the proposed standard was financially unrealistic and, if adopted, would require the industry to obtain additional locomotives or trainsets, driving up the cost of the final rule and significantly affecting the rule's cost-benefit analysis. APTA stated that the Statute prevents FRA from adopting a standard that "requir[es] a railroad carrier to cease or restrict operations upon a technical failure of an inward- or outward-facing image recording device or in-cab audio device,"²⁸ and asserted that the operating railroad should be free to repair or replace the device "as soon as

practicable" under the Statute. APTA added that, given passenger railroads' voluntary installation of these devices, railroads find it in their best interest to repair or replace these devices for many reasons independent of Federal requirements.

Metra agreed with APTA's assertion that FRA's proposed standard conflicted with the Statute. Metra suggested that FRA should interpret "as soon as practicable" under the Statute to mean 48 hours at a minimum. Metra stated that, because the locomotive recording systems it uses require substantial investment in both money and workforce any requirement to repair or replace non-functioning equipment that provides for less than 48 hours is not practicable. In its comments, AAR agreed with Metra that "as soon as practicable" should be at least 48 hours from the discovery that the device has failed, citing the cost of image recording devices, the multitude of components that could cause the device to fail, and the inevitability of tampering.

Amtrak also commented on the appropriateness of FRA's proposal and suggested basing the standard on the "next capable facility" rather than on a specific unit of time. According to Amtrak, long-distance passenger trains may operate for multiple days until a suitable repair facility is available to replace equipment and often calendar day inspections are performed at outlying locations where minimal workforces do not have the suitable means to replace equipment. Amtrak believed a requirement to repair the equipment at the next capable facility would address this concern, and that this standard should apply to both inward- and outward-facing locomotive cameras.

A private citizen also commented that, in some situations, passenger trains are parked overnight far from comprehensive repair facilities. The commenter therefore believed there should be an allowance for locomotive recording devices to make it back to an appropriate repair facility without cancellation or delays to passenger trains. The commenter stated that ultimately the use and repair of the devices should not force passengers into less safe situations by requiring them to drive instead of taking the train, given that rail is a safer mode of travel.

However, not all commenters objected to FRA's proposed standard. BLET stated that locomotive cameras should be treated the same as any device mounted on or in a locomotive cab, asserting that locomotive cameras are appurtenances under § 229.7 and should be treated in a similar fashion to event

²⁷ FRA published a 60-day Federal Register notice to solicit public comments on the new F 6180-49AP form. 87 FR 50914 (August 18, 2022).

²⁸ See 49 U.S.C. 20168(j).

recorders under § 229.135. BLET believed the calendar day inspection requirement mirrors long-established requirements for removing event recorders from service under § 229.135(c), is no more burdensome than the event recorder requirement, and should be included in this final rule.

FRA agrees with BLET's reasoning and is largely adopting the standard proposed in the NPRM that all inward- and outward-facing image recording devices either need to be repaired or replaced within the next calendar day inspection or be removed from service. However, after consideration and review of the comments received, FRA reexamined how this requirement would affect long-distance intercity passenger trains and is creating a new exception to the requirement for these trains. Instead of taking a lead locomotive on a long-distance intercity passenger train out of service if it cannot be repaired or replaced by the next calendar-day inspection, the locomotive may continue in service until arrival at its destination terminal or its nearest forward point of repair, whichever occurs first. At that point, the locomotive must be taken out of service until the device is repaired or replaced.

FRA determined an exception for long-distance intercity passenger trains was necessary, taking into further account the implications of the difference between the application of this final rule and the locomotive event recorder rule in § 229.135. Section 229.135 requires locomotive event recorders to be installed on both freight and passenger locomotives, yet this final rule requires locomotive image recording devices to be installed only on passenger train lead locomotives. Because a much smaller number of locomotives will be required to have compliant image recording devices than event recorders, FRA expects there will be a correspondingly smaller number of locations throughout the nation where properly equipped replacement locomotives and image recording devices are available, as well as where appropriate parts and equipment for repair are available. Accordingly, long-distance intercity passenger trains may need to travel beyond the location of their next calendar day inspection until a suitable repair facility is available to repair or replace the equipment, especially because calendar day inspections for long-distance intercity passenger trains are sometimes performed at outlying locations, as Amtrak commented.

This exception is limited to long-distance intercity passenger trains. The

majority of passenger locomotives in this Nation operate in commuter service or short-distance intercity passenger service²⁹—service supported by centralized inspection and repair locations. Passenger railroads operating trains in commuter or short-distance intercity passenger service are therefore expected to have adequate parts, equipment, and facilities available at calendar day inspection locomotives to repair or replace defective image recording systems or devices.

2. Standard's Consistency With Locomotive Recording Devices' Designation as Safety Devices

Hitachi commented that allowing a passenger train to continue in operation without the proper image recording capabilities until the next calendar day inspection conflicts with FRA's defining locomotive recording devices as a safety device under part 218. FRA disagrees that there is a contradiction. Taking a locomotive out of service immediately because a safety device (e.g., a locomotive image recorder) is not working could potentially lead to a more dangerous safety issue (e.g., stranding passengers or overwhelming the safe capacity of station platforms).

3. Documenting When a Locomotive Image Recording Device Has Been Removed From Service

APTA commented that when a railroad removes a locomotive image recording device from service, the final rule should not require a qualified person to record the removal date on Form FRA F 6180-49A, under the REMARKS section. As discussed above in Section II.H, APTA repeated its objection to the NPRM's proposed requirement that the railroad note the presence of any image or audio recording system on Form FRA F 6180-49A. APTA stated that passenger railroads already address the issue by providing information to affected employees through operational notices. In addition, APTA believed adding this paperwork burden is not beneficial to safety, and claimed that FRA has not considered this cost in its cost-benefit analysis.

Although FRA agrees with established legal precedent that train crews have no expectation of privacy in a locomotive cab, excluding the sanitation compartment, FRA disagrees that this form notation requirement is a paperwork burden without a safety benefit. As discussed above in Section

²⁹ Short-distance intercity passenger service means service provided exclusively on the Northeast Corridor or between cities not more than 125 miles apart. 49 CFR 238.5.

II.H, passenger railroads will be required to note in the REMARKS section of new Form FRA F 6180-49AP, specifically for passenger locomotives, when an image recording device has been removed from service. This notation will serve as a quick reference to inform crewmembers and other passenger railroad employees (e.g., mechanical employees responsible for locomotive repairs, maintenance and inspection) of the status of the locomotive's recording devices and the image recording system on board any passenger locomotive. The final rule varies slightly from the requirement proposed in the NPRM in that such a notation will be made in the REMARKS section of Form FRA F 6180-49AP—not Form FRA F 6180-49A. Form F 6180-49A will be exclusively used by locomotives in freight or switching service and by passenger locomotives that are not operated as the lead locomotives in commuter or intercity passenger train service. In response to APTA's cost-benefit analysis comment, FRA has updated its cost-benefit analysis to discuss that the costs are incorporated in locomotives' routine scheduled maintenance. The removal from service requirements in § 229.136(i) do not apply to audio recording devices, which are not required to be installed under this final rule.

In its comments, Amtrak asserted that a notation on form FRA F 6180-49A is not sufficient notice that a locomotive's inward- or outward-facing camera is out-of-service. Instead, Amtrak recommended making a record in an electronic maintenance system and opening a work order for repair, along with applying a non-compliant tag on the equipment. Amtrak stated such a process would be similar to that for the failure of dynamic brakes under § 232.109 of this chapter.

FRA maintains that the requirement as proposed is adequate to provide notice that either the locomotive's inward- or outward-facing camera system is malfunctioning. Moreover, the reporting of any defect on a locomotive is subject to the calendar day inspection requirements in § 229.21. However, part 229 does not require a non-compliant tag to be placed on a locomotive with a defective event recorder under § 229.135, and no such tag is required under this final rule.

J. FRA Approval Process for Locomotive Image Recording Systems and Devices

1. Necessity of the Approval Process

In response to FRA's proposal, APTA questioned why an approval process

was needed, stating that the recording system is not safety-critical. Further, APTA commented that FRA had not accounted for the approval process in the cost-benefit analysis, asserting that an approval process for any element increases the cost of the rule and implementation time. According to APTA, given the widespread, voluntary implementation of these systems, FRA should not require their approval and should, instead, allow passenger railroads to create and maintain a written description that can be made available upon request to FRA at any time.

FRA has not adopted APTA's comment. The Statute requires FRA, as the Secretary's delegate, to establish a review and approval process for inward- and outward-facing locomotive image recorders.³⁰ This final rule therefore includes a review and approval process as the Statute requires. Nonetheless, FRA has adjusted the economic analysis to include the approval process cost; for more detailed information on the cost, please see the RIA accompanying this final rule. Further, for the reasons discussed below in Section II.M, FRA disagrees with APTA's assertion that image recording devices are not safety-critical. Notably, FRA is amending part 218's prohibitions against tampering with safety devices specifically to include passenger locomotive recording devices and is adopting § 229.136(j) to expressly prohibit disabling or interfering with passenger locomotive recording systems.

2. Clarifying the Approval Process

In commenting on proposed § 229.136(g), Wi-Tronix stated that the approval process for locomotive recording devices needed clarification. According to Wi-Tronix, the proposed requirements would lead to confusion and delays in the marketplace because railroads often look for a certified product or service and have little desire to go through an additional certification process. Wi-Tronix requested FRA clarify whether suppliers can self-submit a system for approval, and believed the timelines and process (including each railroad needing separate certification) to be commercially impractical and lead to increased costs and slow the rule's implementation.

Separately, Amtrak requested changing the approval process submission timeframes, citing constraints due to clerical limitations and the logistics of acquiring equipment. Amtrak stated that a more

realistic and achievable timeframe would be 90 days for existing systems and 180 days for proposed systems.

FRA disagrees that the approval process is unclear. Section 229.136(g)(1) explains what a passenger railroad must include in its description of the technical aspects of the locomotive image recording system. Although the paragraph does not provide extensive technical detail, FRA does not consider this to be a limitation but rather to provide the passenger railroads flexibility in preparing their submissions.

FRA also believes 60 days from the effective date of this final rule provides railroads sufficient time to prepare and submit descriptions of the technical aspects of their existing locomotive image recording systems. (Please note that the 60-day period after the final rule's effective date reflects an earlier effective date than indicated in the NPRM, so that the overall length of the submission period is the same.) This final rule takes effect on November 13, 2023, which is 30 days after publication of this final rule. Accordingly, railroads have a total of 90 days from this final rule's publication to prepare and submit descriptions of the technical aspects of their existing locomotive image recording systems. Such description of the technical aspects may be submitted to FRA in electronic form.

In this final rule, FRA is also correcting an error in proposed § 229.136(g)(2) in which FRA stated that the submissions for existing systems must be made "not less than" 30 (now 60) days after the effective date of the final rule. However, the explanation of this proposed paragraph in the NPRM's Section-by-Section Analysis did correctly state that the submissions must be made "not more than" 30 (now 60) days after the effective date of a final rule. FRA is correcting the erroneous language in the text of paragraph (g)(2) accordingly, as railroads are not required to wait until the end of the period to make their submissions. FRA is also revising the approval process in this final rule to make clear affirmative approval from FRA will be required before a passenger railroad's inward- or outward-facing locomotive image recording system can be installed or placed into service. This is a change from the proposal in the NPRM that, in the absence of written disapproval from FRA within 90 days of FRA's receipt of the submission, the railroad's locomotive image recording system would be considered approved. FRA has concluded that a transparent and conclusive approval process is required, and it would not be in the public's

interest to allow for the possibility that a non-compliant system could be approved through unexpected events or inadvertence. At the same time, FRA plans to publish a list of any previously approved systems on its website for railroads' convenience, as FRA noted in the NPRM.³¹

Because this final rule requires FRA's affirmative approval before a locomotive image recording system can be installed or placed into service on a locomotive, if a railroad chooses to submit the required information 180 days before installation of these systems, consistent with Amtrak's comment, FRA would not object. In fact, as a practical matter, FRA encourages railroads to make their submissions well in advance of the submission deadline, so that if the submission were incomplete or requires clarification, or if FRA were to disapprove any or all of a railroad's submission, the railroad could timely respond to minimize, if not avoid altogether, any impact on the railroad's proposed installation schedule or the use of railroad resources.

Finally, in response to Wi-Tronix's comment, the submission must come from the applying passenger railroad, as opposed to a supplier or other party, though it may of course be prepared in consultation with a supplier or other party. This is necessary as each railroad may use potentially different types of locomotives with different internal and external characteristics. How each passenger railroad complies with the requirements of § 229.136, such as (but not limited to) how the inward- and outward-facing locomotive cameras are installed or placed, is for the passenger railroad to describe and demonstrate.

3. Application of the Approval Process to Freight Locomotives

Finally, similar to other comments BLET made on the NPRM, BLET stated that the requirements of § 229.136(g) should apply whether a system is installed on a voluntary basis or mandated by law. FRA disagrees. As discussed previously, the requirements of this rulemaking do not apply to freight locomotives that have or will have installed locomotive image recorders. However, FRA expects that all railroads that voluntarily install recording devices on their locomotives will adhere to practices that are consistent with those in this final rule, and FRA invites parties with questions about the voluntary installation of recording devices on locomotives to contact FRA for such technical assistance.

³⁰ 49 U.S.C. 20168(c).

³¹ 84 35714.

K. Implementation Period of the Rule

1. Four-Year Implementation Period

FRA received several comments about the proposed four-year implementation period within which all lead passenger train locomotives in commuter or intercity passenger service would be required to be equipped with compliant inward- and outward-facing image recording devices. Commenters provided different suggestions on how FRA should set the implementation date for the final rule. APTA stated that if FRA would not exclude from the final rule existing locomotives already equipped with recording devices, the rule should take effect 10 years from its publication date. APTA believed the 10-year period would allow passenger railroads to obtain the full, life-cycle value of locomotive image recording systems installed or soon to be installed, *i.e.*, already under contract and designed. APTA contended that this would be a more effective use of funds, as most passenger railroads are public transportation agencies funded by taxpayer dollars, and also stated that these public agencies must adhere to strict, public procurement rules, and consequently need a considerable amount of time to get public agency procurements completed.

Metra suggested that FRA phase-in the requirements with an 8-year implementation period in which passenger railroads have 70 percent of their locomotive fleets compliant within the first 5 years. Metra stated that it was generally supportive of FRA's implementation requirement, but found the proposed 4-year timeframe to be insufficient for an entity the size of Metra, which has over 529 pieces of equipment requiring installation.

Other commenters supported the proposed 4-year implementation period. The NTSB stated that the deadline would encourage prompt implementation of the final rule's requirements. As the NTSB discussed in its report on the DuPont accident, and as discussed earlier in this final rule, there is a clear investigative benefit to the information provided by locomotive recording devices. The NTSB also noted that it had issued NTSB Safety Recommendation R-10-01 in 2010, on the need for locomotive recorder devices, and that any further delay beyond the proposed deadline in the NPRM would be unacceptable. SMART also commented that the final rule should allow 4 years for passenger railroads to install compliant recording devices, but sought to require that as compliant devices are installed on locomotives, railroads should comply

with the other requirements of the final rule.

FRA maintains that 4 years is an adequate time-period for passenger railroads to comply with the final rule's requirements. Granting passenger railroads a full 10 years or a phased-in 8 years to comply with the minimum requirements would be both excessive and not in the best interests of the public or rail safety. As the NTSB commented, recent accidents involving passenger trains have proven how valuable locomotive image recordings can be as part of post-accident/incident analysis to identify rail safety hazards. The 4-year period allows passenger railroads sufficient time to get significant remaining value out of their equipment while taking into account the increased post-accident investigation benefit and other benefits that result from compliance with the final rule's requirements.

2. Application of the Final Rule to Image Recording Systems on New, Remanufactured, or Existing Locomotives

FRA invited comment on the appropriateness of the proposal that image recording systems installed after one year from the final rule's publication date on new, remanufactured, or existing locomotives used in commuter or intercity passenger service meet the requirements of this final rule. Based on concerns about the length of the public procurement process, number of locomotives already equipped with image recording devices, and the lifespan of these devices, APTA and Hitachi asked that FRA extend the time to comply until after two years from the final rule's publication date.

FRA has decided against extending the time from one to two years because the one-year period is intended to provide an appropriate margin of time for passenger railroads to obtain image recording systems compliant with the requirements of this final rule for installation on new, remanufactured, and existing locomotives. These requirements are minimum standards and are achievable. In this regard, AAR commented that FRA should compare the standards in this rulemaking with the May 29, 2019, standards proposed by Transport Canada to prevent conflicting requirements between Canada and the United States.³² FRA compared the two standards and did not identify any concerns. FRA has also compared the final standards issued by

Transport Canada and this final rule.³³ Transport Canada's standards for inward-facing cameras are more stringent than those in this final rule; however, Transport Canada's standards do not require outward-facing locomotive cameras, which are specifically required by the FAST Act and therefore this final rule.³⁴ Lead locomotives on Canadian passenger trains that enter the United States from Canada must comply with all of the requirements of this final rule.

L. Operational (Efficiency) Testing

In the NPRM, FRA discussed the potential benefits to railroads that use locomotive recording devices as part of their operational (efficiency) testing programs and proposed requirements for railroads choosing to use locomotive recording devices to conduct operational testing under part 217, to protect employees from targeted testing as a form of retaliation. FRA received various comments regarding FRA's proposed amendments to part 217, and the agency's existing operational testing requirements.

1. Application of the Rule's Part 217 Amendments to Freight Railroads

AAR commented that because existing part 217 applies to both passenger and freight railroads, FRA's proposed revisions to § 217.9 (proposed new paragraphs (b)(3) and (4) governing operational testing using locomotive recording devices) would apply to both types of railroads. AAR noted that FRA's stated intent in the NPRM's preamble was that these provisions would apply to passenger railroads only. Accordingly, AAR suggested that FRA modify proposed paragraphs (b)(3) and (4) to specify that the paragraphs apply to passenger railroads only.

AAR is correct. FRA did not intend proposed new paragraphs (b)(3) and (4) to apply to freight railroads. Therefore, in this final rule, FRA is clarifying its intent to exclude freight railroads from these requirements by using the word "passenger railroad," instead of "railroad," in new paragraphs (b)(3) and (4) of §§ 217.9. However, as discussed above in Section II.A.2, it is FRA's expectation that all railroads that voluntarily install recording devices on their locomotives will adhere to practices that are consistent with those in this final rule, notably the new part 217 requirements that serve to protect employees from targeted testing as a form of retaliation when railroads

³² <https://www.gazette.gc.ca/rp-pr/p1/2019/2019-05-25/html/reg5-eng.html>.

³³ <https://gazette.gc.ca/rp-pr/p2/2020/2020-09-02/html/sor-dors178-eng.html>.

³⁴ 49 U.S.C. 20168(a).

conduct operational testing using recording devices or their recordings. Further, under existing § 217.9(h), FRA reviews railroads' operational testing and inspection programs and, if necessary, may disapprove any such program for cause stated.

2. Burden of the Rule's Part 217 Requirements

APTA commented that FRA should not adopt in this final rule any of the requirements FRA proposed to add to § 217.9 because the regular monitoring of image recordings does not need to be under or part of a railroad's operational testing program. Instead, APTA asserted that passenger railroads should be allowed to establish their own practices to monitor employees' compliance with rules and deter them from unsafe actions. APTA also contended that the additional burdens from the requirements FRA proposed may incentivize railroads not to use recording devices in operational testing and therefore reduce one of the benefits of this rulemaking.

In addition, APTA claimed that requiring test subjects for operational testing using locomotive recorders to be selected at random would create an unnecessary cost and burden for passenger railroads, because the ability to use cameras in the railroads' current operational testing plans already exists and this cost was not considered in the NPRM's cost estimate. Finally, APTA objected to FRA's proposed condition that operational testing be completed within 72 hours of the completion of the tested employee's tour of duty, calling it impractical and indicating that such is allowed when testing for radio rules compliance.

FRA disagrees with APTA's comment that the regular monitoring of locomotive recordings does not need to be under a railroad's operational testing program or that passenger railroads should be allowed to establish their own plans and practices to monitor employees using these recordings. Section 20168(i) of the Statute prevents in-cab audio or image recordings from being used to retaliate against an employee. New § 217.9(b)(3) requires passenger railroads to describe how they will randomly select testing subjects, better enabling FRA to oversee that passenger railroads are fulfilling the requirements and railroad supervisors are not unfairly selecting specific employees for operational testing as a form of retaliation. FRA is including in-cab audio recorders and their recordings under paragraph (b)(3), as previously discussed. It does not make sense to require passenger railroads to select

their operational testing subjects randomly when using image recorders or their recordings without applying the same protections to the use of audio recorders and their recordings.

FRA disagrees that the limitations on operational testing will cause passenger railroads to abandon using these devices for operational testing purposes altogether. APTA's assertion that any costs associated with these limitations are unnecessary is flawed, in part because the Statute itself prohibits the use of locomotive recording devices as a medium to retaliate against employees. Further, the RIA accompanying this final rule addresses in more detail APTA's claim that FRA has not sufficiently accounted for the cost of implementing a random selection program for locomotive recordings. Finally, while APTA compares testing for radio rules compliance with using locomotive recording devices for operational testing, listening to radio recordings provides a far more limited window into the crew's activities and has far less potential for abuse than locomotive recording devices.

3. Appropriateness of Using Locomotive Recordings for Operational Testing

BLET also objected to FRA's proposed revisions to § 217.9 allowing railroads to utilize locomotive recordings for operational testing purposes. BLET asserted that railroads have historically used operational testing as an indirect way to discipline their employees. According to BLET, although locomotive engineers are accustomed to how operational testing is currently done (e.g., sporadic skills tests in the field), use of recording devices would put engineers under "constant surveillance." BLET believed crewmembers would feel continually watched and change how they act as a result, because crews would be worried about performing for the camera first and reacting to the circumstances that are actually occurring second, which would negatively impact safety.

In contrast to BLET's comment, FRA received comments from TTD, Metra, and SMART, in support of FRA's proposed additions to § 217.9. TTD called FRA's proposed requirement for operational testing subjects to be selected at random a "meaningful step towards fair usage of recorded images." Metra agreed with TTD and specifically asked FRA to make clear in the final rule that passenger railroads could not use subjective factors in the utilization of locomotive recordings to conduct operational tests. SMART and BLET also "applauded" FRA on its proposed

random testing requirement and SMART stated that the provision would prevent a vindictive supervisor from tracking an employee the supervisor personally dislikes for punishment, such as a union representative. While still opposed to locomotive recordings being used for operational testing purposes at all, BLET also commented that how the random testing requirement was actually practiced by rail carriers in the field would be the determining factor on carrying out the intent of the regulation.

TTD also expressed its support for the proposed requirement that any operational test or inspection must be performed within 72 hours after the employee's tour of duty. TTD called this a critical tenet to ensure that data received by the railroads is not misused and believed FRA should not weaken any of the proposed protections in a final rule.

FRA agrees with TTD, Metra, and SMART and is adopting the proposed requirements in paragraphs (b)(3) and (4). FRA notes that APTA and BLET objected to the proposed requirements for opposing reasons. As stated above, APTA commented that FRA should not adopt any of the proposed requirements, not because APTA is opposed to using locomotive recording devices in operational testing, but because APTA believed the regulations would place constraints on the use of the devices that many passenger railroads already use as part of operational testing and cause these railroads to change their existing testing programs. APTA preferred FRA instead let railroads make their own decisions on how to use their locomotive recording devices. Conversely, BLET objected to the proposed requirements on the basis that railroads should not be allowed to use locomotive recording devices for operational testing in any circumstance, because they could be used to unfairly target their employees. As explained below, the conditions FRA is adopting in this final rule address the targeting of employees when passenger railroads use locomotive recording devices for part 217 testing purposes.

Without addressing BLET's allegation that operational testing has historically been used to target and discipline employees, FRA acknowledges that the amendments to § 217.9 in this final rule are intended to ensure passenger railroad supervisors do not use inward-facing locomotive cameras or in-cab audio recording devices to target specific employees. Hence, FRA's insistence that subjects for operational testing be selected at random, that there must be a testing plan that FRA can

review and disapprove for cause, and that all operational testing must be completed within 72 hours of the employee being tested completing his or her shift. BLET also commented that employees are used to having their skills sporadically tested in the field as opposed to the “constant surveillance” of inward-facing cameras. However, the new regulations require employees to be selected at random. Constant surveillance of a certain employee will violate the randomness requirement.

Further, as stated previously, locomotive engineers and other railroad employees who work in a locomotive have no expectation of privacy, with the exception of the locomotive’s sanitation compartment. Railroad employees can be observed in the locomotive at various times by railroad management, FRA inspectors, or even members of the public. Although BLET maintained that the constant surveillance of railroad employees would negatively impact the employees’ behavior, passenger railroads have been using locomotive cameras long before this rulemaking without any such observable impact on passenger train safety.

4. FRA’s Authority To Regulate the Use of Locomotive Audio Recordings in Operational Testing

APTA commented that FRA should not adopt in § 217.9 any reference to audio recordings or related language as it would provide FRA with regulatory authority for something not within the scope of the NPRM or under current FRA regulations. FRA disagrees. FRA widely discussed and asked numerous questions about audio recording devices in the NPRM, in addition to raising the requirement in the NPRM. FRA specifically proposed that inward-facing locomotive image and in-cab audio recordings, if used for operational testing, would be subject to the proposed requirements in § 217.9. Additionally, FRA has for some time regulated railroads’ operational testing programs, and specifically what railroads can and cannot do as part of these programs.

5. Effect on FRA’s Confidential Close Call Recording System (C3RS)

BLET commented that allowing locomotive recording devices as an operational testing tool would have a negative effect on FRA’s C3RS program. C3RS is a confidential reporting system that allows railroad employees in the field to report incidents where a potential accident was averted, or a risk was mitigated. The report is generated by the railroad employee without fear of reprisal from railroad management.

BLET stated that confidentiality is the key to the success of the C3RS program but, with the constant surveillance of locomotive cameras, railroads may not feel there is an advantage to C3RS if they can simply watch accumulated video to identify trends. According to BLET, when a railroad has observed sufficient footage it could modify its operational testing to increase the number of exceptions and consequent cases of employee discipline, and thereby ignore the underlying safety problem or rule violation because the person committing the violation would be removed.

FRA does not believe that inward-facing cameras used for operational testing will negatively affect FRA’s C3RS program. Passenger and freight railroads began installing inward-facing cameras in locomotives many years ago and FRA is not aware of any evidence, nor has BLET provided any, that these cameras have negatively impacted the C3RS program.

6. Rules or Regulations Locomotive Recording Devices Should Address as Part of a Passenger Railroad’s Operational Testing Program

BLET commented that in the event recorder regulation all actions required to be captured are enumerated in the regulation. However, BLET asserted that for image or audio data captured by a camera or other recording devices, the NPRM lacked specificity as to which rules or regulations the data could be used to determine compliance. FRA did not provide in the NPRM, and declines to do so in this final rule, specific guidance on how the locomotive cameras should be used for evaluating compliance with specific rules or regulations, other than such use must comport with the stated protections for employees. FRA expects that railroads will use the locomotive image recording devices as a tool for purposes of carrying out their operational testing program requirements, evaluating compliance with the rules and regulations they already take into consideration as part of their operational testing programs.

M. Locomotive Recording Devices as Safety Devices Under Part 218

FRA received comments from APTA, BLET, and the NTSB on FRA’s proposal to include image and audio recording equipment installed on a passenger train locomotive as a “safety device” under § 218.53(c). APTA objected to the proposed changes and did not believe including an image recording device as a safety device under part 218 was necessary. APTA claimed that although

tampering has not been a known issue for passenger railroads, the railroads already have internal rules and policies that prevent tampering with locomotive image recording devices. In addition, APTA stated that locomotive cameras do not need protection from the public, as they are not readily publicly accessible, and that the presence or operability of locomotive image recording devices does not affect the safe operation of a passenger locomotive or the train it is powering because these devices are strictly forensic in nature and cannot prevent any accident or incident.

In contrast to APTA’s position, both BLET and the NTSB supported including locomotive recording devices as safety devices under part 218. The NTSB agreed with FRA that treating a locomotive-mounted image or audio recording device as a “safety device” will deter employees from tampering with or disabling one of these devices. BLET also agreed, but added that the technical requirements and standards for locomotive recording devices should be no less stringent than the requirements for event recorders.

FRA agrees with the NTSB that including locomotive recording devices under the definition of “safety device” in § 218.53(c) will deter railroad employees from tampering with such devices. However, because a locomotive recording device is not currently defined as a “safety device,” FRA is not aware of the extent to which there may be tampering with these devices. FRA expects locomotive recording devices to be at least as, if not more, susceptible to tampering as event recorders, which are safety devices under part 218. For example, as stated in the NPRM, in one incident of tampering with an inward-facing locomotive camera system, FRA viewed a recording in which an engineer covered the inward-facing cameras on his locomotive, apparently unaware of another camera mounted on the ceiling near the back wall of the cab. That camera recorded him appearing to play a game on a personal electronic device while operating a moving freight train. Accordingly, the changes to part 218 will serve not only to discourage passenger railroad employees from tampering with these important safety devices, but to hold individuals who do engage in such tampering accountable under FRA’s rail safety regulations.

Even if train crew tampering with locomotive image recorders would continue to be handled under passenger railroads’ rules and policies, as APTA suggested, this does not confer the same significance as a safety device subject to part 218. By including passenger

locomotive recorders as safety devices under part 218, engineers and conductors directly risk the revocation of their FRA certification for tampering with these devices. Further, this change ensures that all passenger railroads handle tampering with locomotive recording devices according to uniform FRA standards, instead of having individual railroads apply potentially different internal rules and policies.

FRA also disagrees with APTA that the presence or operability of image recording devices does not affect the safe operation of a passenger locomotive or the train it is powering. Although locomotive recording devices can provide information about the actions of train crewmembers following the occurrence of an accident or incident, properly function recording devices can serve additional safety purposes. In its comments to FRA, NCTD stated that its COASTER commuter rail service can currently observe through its inward-facing cameras in real time when the equipment is in range of the railroad's wireless mesh network along NCTD's right-of-way. FRA notes the ability to observe a train crew in real time could provide the railroad an opportunity to intervene if, for example, it observed unauthorized persons in or around the locomotive cab, including closely monitoring interactions with passengers, in addition to curbing violations of railroad rules that could lead to a potentially catastrophic incident or accident. In this regard, Wi-Tronix commented that the benefits of being able to livestream video and data during emergency situations would be a great benefit to the public, as well as when the train crew experiences a health issue or there is hostile activity in the locomotive cab.

Regardless of whether locomotive recording devices are monitored in real time, the train crews' awareness of the devices will deter behavior that can negatively affect railroad safety, such as crewmember cell phone use while performing safety-sensitive functions, and the presence of cameras may also deter unauthorized occupancy of the locomotive or curb actions of other persons who may interact with the crew. Although the information currently provided by locomotive recording devices is mostly forensic in nature, the information can be critical in post-accident analysis and cannot be obtained from other sources such as locomotive event recorders. For instance, while locomotive event recorders provide information on data elements including locomotive speed and the amount and time of the locomotive's brake application,

information from recording devices may be particularly useful in accidents arising from human factor causes, as image data can show investigators what the train crew was doing in the locomotive from a perspective that event recorders cannot provide. The railroads can then use this information to change railroad rules or revise their training programs to help prevent these types of accidents from reoccurring. This post-accident/incident data will be a vital source of information for FRA, the NTSB, and railroads to determine the cause of accidents/incidents as well as whether any action is necessary to prevent similar incidents from occurring in the future.

FRA also received a comment from Metra about the addition of § 218.53(d), which clarifies that the requirements of §§ 218.59 and 218.61 do not apply to recording devices voluntarily installed on freight locomotives. Metra noted that because these devices are voluntarily installed by freight railroads, the railroads can operate lead freight locomotives without such functioning recording devices. Metra is correct that freight railroads can operate freight locomotives without recording devices in compliance with this rule. However, as previously discussed, unless used as a rescue locomotive, a freight locomotive used in commuter or intercity passenger service must comply with all the requirements of this final rule.

N. Twelve-Hour Recording Period for Locomotive Image Recording Devices

1. Appropriateness of the 12-Hour Recording Period

APTA commented that although it understood FRA arrived at the 12-hour retention period for locomotive image recording data by reference to NTSB recommendations and the Statute's requirements, the requirement was excessive and unnecessary compared to the requirements of other federal agencies. APTA stated that the Federal Aviation Administration requires only 30 minutes of recording, claimed that the NTSB cited limited data supporting its recommendation for the 12-hour timeframe, and asserted that, unlike some freight trains, commuter train trip lengths are much shorter and "turn backs," where the locomotive is in the lead in one direction and a cab car is in the lead in the other direction, are common after completing a run or directional trip. According to APTA, crew on-duty time for commuter and intercity passenger routes are scheduled to minimize jobs close to 12 hours on duty, some crews have a respite before

their next trip, and some crews may also change train consists during their duty tour. APTA believed these elements contribute towards reducing the overwrite potential of critical image recordings available to investigate an incident and therefore asked that passenger railroads be allowed to determine their own time for storing their locomotives' image recording data. APTA added that passenger railroads already have image recording devices in other vehicles in a train consist for security purposes and noted they are generally recorded onto the same storage system as locomotive recording systems; consequently, APTA asserted that a shorter storage duration for locomotive recorders is necessary from a capacity perspective.

Hitachi also asserted that 12 hours of required recording time is excessive, commenting that accidents happen due to actions or inactions that span just minutes. Hitachi suggested a two-hour recording window would be more appropriate instead.

However, the Statute specifically mandates that locomotive image recording devices be capable of a minimum of 12 hours of continuous recording.³⁵ Accordingly, to comply with the Statute, this final rule cannot require anything less. Further, FRA disagrees that only the crew's actions immediately before an accident or incident are relevant to determining the cause of an accident or incident. The visual evidence of what was occurring in the time leading up to an accident or incident, including evidence of possible interactions with passengers or other persons, as well as evidence of outside objects striking or even entering the cab, can prove useful in any subsequent investigation of the accident or incident.

2. Feasibility of 24 Hours of Continuous Recording Capability

Responding to FRA's questions in the NPRM as to whether requiring passenger railroads to maintain a total of 24 hours of continuous recording capability would be feasible, Amtrak stated that the potential cost to double the recording timeframe from 12 to 24 hours would be "astronomical," with only minimal additional benefits. According to Amtrak, the current marketplace does not have solutions that can capture recording time beyond approximately 14 hours and, under the hours of service laws, crews are only permitted 12 hours of continuous time on duty.

FRA agrees with Amtrak that the cost of a 24-hour recording timeframe would

³⁵ 49 U.S.C. 20168(b)(1).

outweigh the benefits, and that such a lengthy amount of recording time is not practical or necessary.

O. Privacy Considerations

FRA received several comments highlighting privacy concerns with FRA potentially taking possession of locomotive recordings as part of an accident investigation. The NPRM contains a detailed discussion of these privacy issues, and FRA specifically stated that it would “rarely take possession of recordings.” In its comments, APTA asserted that FRA should state that it will “never” take possession of recordings. According to APTA, the NTSB has protections in place that would protect the release of such recordings (49 U.S.C. 1114(c) and (d)), while FRA does not. APTA stated that FRA inspectors should be able to view any video or listen to any audio recordings, but to prevent the release of sensitive data, FRA should not take possession of the recordings. APTA asserted that FRA should not be allowed to take possession of recordings unless FRA has the same statutory prohibition as the NTSB protecting against the release of information.

The NTSB stated that it has longstanding legal restrictions and procedures in place that protect crew privacy and prevent the public release of sensitive onboard audio and video recovered in the accidents it investigates. The NTSB noted that 49 U.S.C. 1114(c) and (d) prohibit the agency from publicly disclosing voice and video recording from inside locomotive cabs involved in accidents or incidents. The law also specifies the circumstances under which the NTSB may make public an audio transcript or written depiction of visual information relevant to an accident or incident. Thus, the NTSB believes that current Federal law protecting against the public release of locomotive image or audio recordings during NTSB investigations is sufficient.

AAR also commented that the Statute stipulates that DOT may not disclose to the public “any part of an in-cab audio or image recording . . . related to an accident or incident investigated by the Secretary.”³⁶ According to AAR, the statutory language is clear that Congress intended to include both inward- and outward-facing cameras, and FRA should clarify in the regulatory text that “in-cab” means both inward- and outward-facing cameras, “as colloquially, ‘in-cab’ refers to inward-facing cameras only.”

Finally, SMART commented that it supports the nondisclosure of audio and image recordings or transcripts of oral communications related to an accident investigated by FRA.

As raised in the comments, valid privacy concerns exist on the appropriate protection and dissemination of locomotive recordings that are made, particularly where an accident has occurred and the recordings may be graphic and violent. It is not desirable for railroad employees or their families to have such images released publicly. Congress has previously provided statutory protections for a train’s audio and image recordings that the NTSB takes possession of during the course of its accident investigations (49 U.S.C. 1114(d) and 1154(a)). Therefore, when the NTSB takes possession of such locomotive recordings, it is prohibited from releasing the contents of the recordings (except that transcripts may be released as part of its accident investigation proceedings).

Similarly, the Statute (49 U.S.C. 20168(h)) prohibits FRA from publicly disclosing recordings that FRA takes possession of after a railroad accident has occurred. Subsection (h) of the Statute, which is similar to the FOIA exemption for locomotive recordings applicable to the NTSB at 49 U.S.C. 1114(d), prohibits FRA from disclosing publicly locomotive audio and image recordings, or transcripts of communications by and among train employees or other operating employees, or between such operating employees and communication center employees, related to an accident investigated by FRA.³⁷ Moreover, the Statute does not limit these protections to such recordings and transcripts of communications involving locomotives used only in intercity or commuter passenger train service. Section 20168(h)’s protections apply regardless of whether the underlying recording devices are required to be implemented by this final rule. Consequently, this subsection protects recordings and transcripts of communications involving locomotives on which the devices are voluntarily installed—notably, such locomotives used in freight service. In addition, FRA will apply these subsection (h) protections not just to recordings from inward-facing locomotive recording devices, but to

³⁷ Interested parties should note that FRA may make public a transcript or a written depiction of visual information that FRA deems relevant to the accident at the time other factual reports on the accident are released to the public.

recordings from outward-facing recording devices as well.

The Statute’s prohibition on FRA disclosing publicly locomotive audio and image recordings or transcripts of oral communications among certain railroad employees addresses the concerns expressed by commenters. Therefore, FRA declines to adopt APTA’s suggestion to “never” take possession of a locomotive recording. As stated in the NPRM, for the most serious of rail accidents, FRA anticipates that the NTSB will take possession of locomotive recordings, as they currently do, and that FRA will have the opportunity to view or listen to the recordings as a party to the investigation and in conducting its own parallel investigation under its separate statutory authority (49 U.S.C. 20107(a)(1)). However, in the vast majority of rail related accidents, the NTSB does not launch an investigation, and FRA is the sole Federal accident investigator. In these accidents or incidents, FRA normally attempts to view the recordings while they are still within the railroad’s possession. However, if necessary, FRA has the statutory authority and obligation, as the Secretary’s delegate to investigate railroad accidents, to take possession of locomotive image and audio recordings as part of an FRA accident investigation or investigation of a violation of a railroad safety law, regulation or order.³⁸

P. Abuse of Locomotive Recording Devices

FRA received several comments expressing concerns that locomotive recording systems would be used as a form of retaliation against railroad employees, even though using passenger locomotive recording devices to retaliate against employees is prohibited by the Statute.³⁹ BLET commented that how locomotive recording devices are ultimately used is a critical issue for its members, and that the proposed rule contained no real protection from abuse. BLET asserted that, although the requirement that recordings be prohibited from being used to retaliate against an employee was well-intentioned, how retaliation is defined will be the key to ensuring whether Congress’ intent to prevent recordings from being used as devices for retaliation will be realized. BLET also stated that FRA misunderstood Congress’ non-retaliatory intent and that part 240 has been serially revised to thwart repeated attempts by numerous

³⁸ See 49 U.S.C. 20107(c).

³⁹ 49 U.S.C. 20168(i).

³⁶ 49 U.S.C. 20168(h).

carriers to misuse its provisions as a way to discipline their certified engineer workforce. BLET asserted this will also occur with locomotive recording devices in the absence of a uniform set of standards and requirements for all locomotive recording devices that limits their use to legitimate accident investigations.

Hitachi also expressed concerns with how locomotive recording devices would be used and commented that there is significant room for abuse if the proposed analytic tools are used for purposes outside of the narrow scope defined by the proposed rule. Hitachi therefore recommended that FRA bar railroad operators or owners from utilizing recordings for purposes other than training or accident investigations.

SMART commented that FRA misinterpreted Congress' intent to prevent the use of locomotive recording devices for retaliation by concluding that the anti-retaliation provision of the Statute did not apply to railroad rules violations discovered via locomotive image or audio devices.⁴⁰ SMART claimed that the Statute is clear that in-cab audio or image recordings obtained by a passenger railroad cannot be used to retaliate against an employee, 49 U.S.C. 20168(i), and therefore FRA was reading something into the section not stated in the statute.

FRA disagrees with SMART's contention that the investigation of a railroad safety violation violates the Statute's anti-retaliation requirements. One of the purposes of this rulemaking is to use locomotive recording devices as a tool to identify and address safety violations that endanger public safety, such as personal electronic device usage while performing safety-critical duties. This purpose is not inconsistent with the Statute, which addresses retaliation implicated by other existing statutes (e.g., the railroad employee whistleblower law at 49 U.S.C. 20109).

Amtrak commented that it already has an established company program and process in place governing the use of audio and visual recordings for compliance means only.

FRA disagrees with Amtrak's suggestion that a railroad's company policy is sufficient to prevent retaliation incidents. FRA proposed in the NPRM, and is now adopting in this final rule, several requirements to prevent railroad retaliation against trains crews and other railroad employees. This final rule, in compliance with the Statute,⁴¹ specifically limits the purposes for which a passenger railroad may use a

locomotive image or audio recording. In addition, to use any inward-facing locomotive recording device for operational testing, a passenger railroad must develop and comply with a program under part 217 to ensure that testing subjects are selected randomly and any operational test must be completed within 72 hours of an employee's tour of duty. This will prevent the selection of specific candidates for operational testing or being subject to review on footage for an extended period of time to find a potential Federal railroad safety or railroad operating rule to penalize the employee in question. Moreover, as discussed above, it is FRA's expectation that all railroads that voluntarily install recording devices on their locomotives will adhere to practices that are consistent with those required under this final rule, such as the new part 217 requirements that serve to protect employees from targeted testing as a form of retaliation when railroads conduct operational testing using recording devices or their recordings. For further discussion about these requirements, relevant comments, and FRA's response to those comments, please see Section II.L above.

Q. Recording Devices' Effect on Railroad Employees

BLET commented that monitoring the day-to-day performance of workers can have damaging effects outside any of the claimed benefits of the final rule. According to BLET, visual or audio surveillance will build resentment and a climate of distrust between the railroad and its workers. BLET asserted that no matter the privacy protections and respect of use adopted in passenger railroad policies, railroad employees will resent the presence of the locomotive recording devices and find their presence offensive, and there will be a multitude of unforeseeable consequences that neither FRA, nor the passenger railroads have considered.

It is likely that Congress took these concerns into account when mandating the installation of inward- and outward-facing image recording devices in all regularly scheduled intercity or commuter rail passenger locomotives in the Statute. Locomotive recording devices are not a novel technology. Locomotive cameras and recording devices have become common within locomotives over the past two decades. FRA does not believe this final rule will introduce a major change to the working conditions of a large segment of passenger train crews, as suggested by BLET.

R. Download and Security Features of Locomotive Recording Systems

1. Federally Mandated or Industry-Adopted Standard

FRA received several comments about the download and security feature requirements for locomotive image recording systems proposed in the NPRM (paragraph (d) of proposed § 229.136). Amtrak commented that this final rule should not regulate the download and security features of these systems, believing an industry-adopted standard is better suited to fit the technological capabilities of locomotive image recording systems. APTA agreed with Amtrak, and commented that passenger railroads should be allowed to develop their own best practices for conducting inspections and downloading data without prescriptive standards, stating that passenger railroads have been handling these downloads for quite some time.

In contrast, BLET commented that there should be uniform standards and requirements in this final rule for all locomotive-mounted recording systems, electronic downloads, and security features, such as encryption functions, etc. BLET stated that if this type of data is not encrypted and a strict chain of custody is not maintained, any credibility or value of using the data for post-accident investigation could be called into question. According to BLET, wireless transmission of audio or image recording data should also be prohibited to prevent such private, personal data from being hacked.

The standard FRA adopts in this final rule balances the concerns of the commenters. The standard adopted is broader than that proposed in the NPRM, which addressed electronic security measures only to prevent unauthorized downloads of recordings. As adopted in this final rule, § 229.136(d) requires passenger railroads to develop a system that allows only authorized downloads and has electronic security measures to prevent unauthorized access to, and download, deletion, or alteration of, the recording system or its recordings. FRA therefore expects that passenger rail will safeguard the recordings using encryption technology or equivalent data protection measures. However, this paragraph does not prescribe how such a system must be specifically created or structured, and recognizes that recordings must be accessible for review during an accident or incident investigation, as provided in 49 U.S.C. 20168(b)(3), and may be put to other lawful purposes, see § 229.136(f)(3). As a result, these requirements further

⁴⁰ 84 FR 35712, 35715 (July 24, 2019).

⁴¹ See 49 U.S.C. 20168(d).

FRA's objective to protect the recording systems and their recordings, while providing railroads the flexibility on how to best achieve that protection, which will allow for differences in the specific systems used. For similar reasons, FRA disagrees that wireless download and transmission of audio or image recording data should be prohibited, because it would unduly restrict the technology that may be used. Whether data is downloaded and transmitted via wired or wireless technology, passenger railroads are responsible for ensuring the integrity of the process under § 229.136(d), which includes preventing the unauthorized downloading, deletion, or alteration of the recording system or its recordings.

2. Standard or Crashworthy Memory Modules

Hitachi commented that, as proposed, the requirements for download and security features of locomotive recording systems would seem to require both a standard and a crashworthy memory module. Hitachi stated that, if a crashworthy module meets all the requirements, then standard memory modules are unnecessary and could potentially create confusion.

FRA has not adopted the reference to standard memory modules in this final rule, as its inclusion in the NPRM was in error. Locomotive recording device data, whether it be audio or image recording data, must be stored on a crashworthy memory module. Because locomotive image or audio recordings cannot be stored on standard memory modules, the download and security features required of locomotive recording systems in § 229.136(d) refer only to certified crashworthy memory modules in this final rule.

S. Self-Monitoring and Self-Reporting Systems or Devices on Locomotive Image Recording Systems

1. Whether Cost of These Systems or Devices Was Adequately Considered

Wi-Tronix commented that locomotive image recording systems should be required to be self-monitoring and self-reporting, stating that the technology exists for these systems to monitor their own operational health and report their status. FRA agrees that a self-monitoring system is necessary to alert train crews and railroad maintenance crews conducting inspections whether the recording system is even working. Without a self-monitoring system, a locomotive could operate for an extended period of time

without a functioning locomotive camera system.

APTA commented that the self-monitoring capabilities in the proposal did not appear to be a part of FRA's cost estimate for installation or ongoing operation and maintenance costs, and requested that FRA justify the requirement using a cost-benefit analysis. Although FRA did include the cost for self-monitoring capabilities in the NPRM's RIA, as FRA assumed that any locomotive image recording device would have a self-monitoring capability built into the initial design, FRA has updated the cost based on the comments that were received and provided a range of costs to better account for any variance that might occur in the cost of such devices.

2. Taking a Sample Download During a Periodic Inspection

In addition, APTA questioned the requirement that railroads take a sample download during a periodic inspection to ensure that the image recording system is functioning properly. APTA stated that passenger railroads need to limit those with the ability to download and access audio/image recordings, asserting that many railroads do not allow their maintenance personnel to do this. According to APTA, there could be a need to verify proper functioning during the periodic inspection, but taking a download should not be required and there are other ways to ensure proper functionality.

In the NPRM, FRA asked for comment on the types of restrictions that should be placed on sample recording device downloads from passenger train lead locomotives under proposed § 229.136(e)(2), as FRA anticipated that sample downloads for inspection or maintenance purpose might often be taken by non-managerial or operating employees, such as mechanical department employees in a locomotive repair facility. BLET responded by stating it is reasonable to conclude that railroads will need to check images and recordings from time to time to ensure the proper functioning of the system. However, BLET added that the individual checking the system should not also be conducting operational testing, unless that individual is qualified to do so and is authorized to perform operational tests, and requested that FRA require all recordings used for inspection or testing purposes to be deleted once system functioning is confirmed.

Based on the comments received, FRA is modifying the proposed requirement. Passenger railroads must still conduct a sample download from the image

recording system's crashworthy memory module; however, FRA is changing the frequency of the download test from a periodic to an annual requirement. This change will reduce the need for railroad employees to download and observe image recordings. Of course, passenger railroads may ensure the proper functioning of a recording system at any time. The authority under § 229.136(f)(3)(vii) to perform inspection, testing, maintenance, or repair activities to ensure the proper installation and functioning of an inward-facing image recorder is not limited to fulfilling the minimum requirements of § 229.136(e)(2) to take a sample download from the image recording system's crashworthy memory module to confirm proper operation of the system.

FRA makes clear that the final rule requires the sample download for the annual test be taken directly from the image recording system's crashworthy memory module, or its equivalent in the case of remote storage approved under § 229.136(g). Taking the download from this memory module is necessary to ensure not only that the locomotive cameras are unobstructed and pointing in the correct position to capture crew activity, but to ensure that the camera system is properly recording to the memory module. For example, an inward-facing camera could be technically recording, but the camera could be out of focus. Further, this clarification is also intended to prevent any misunderstanding that passenger railroads could comply with this paragraph's testing requirements by simply streaming a recording from an image recording system without downloading the recording from the system's memory module. An actual download from the system's crashworthy memory module is required to ensure the integrity and proper functioning of the image recording system.

Although this final rule creates a specific annual test for locomotive image recording systems, passenger railroads must inspect the locomotive's image recording devices as part of other locomotive inspections required under part 229 (e.g., daily, 33-day mechanical, 92-day periodic, and 184-day periodic inspection). During these inspections, the passenger railroad must note and correct any non-complying conditions related to locomotive recording devices that can be determined from these inspections, especially if it can be determined that the locomotive recording device is no longer functioning properly or there has been any tampering with the locomotive

recording system or any locomotive recording device.

T. Preservation and Handling Requirements for Locomotive Recording Devices and Recordings

1. Chain-of-Custody Requirements

In commenting on the preservation and handling requirement for passenger locomotive recording devices as proposed in the NPRM, APTA asserted that FRA did not account for the cost of the proposed chain-of-custody requirements as part of FRA's cost estimate for ongoing operation and maintenance costs added. APTA therefore requested that FRA justify these costs versus the established benefits. FRA acknowledges it inadvertently omitted these costs from the NPRM's RIA. FRA has revised the RIA accompanying this final rule accordingly to include these costs.

2. Prohibitions on the Public Release of Locomotive Recordings

FRA also received comments on whether FRA should create a specific provision that prohibits the public release of an image or audio recording by any person or railroad. BLET commented that there should be a restriction on public release, stating that without legal limitations upon disclosure, a regulatory scheme for governing the use of in-cab cameras presents a significant problem of public and personal privacy. According to BLET, FRA has not yet stated an intention to curb usage by the railroad carrier or shield employees from improper disclosure of sensitive footage, asserting that information from locomotive recorders should be strictly controlled to prevent posting on social media websites under the guises of promoting education and safety. BLET also asserted that FRA should prohibit a railroad from disclosing locomotive recording data of its employees to another railroad that is not the employing railroad. BLET added that if audio is recorded, it should be recorded on its own separate channel so it can be isolated for sound quality.

APTA commented that many agencies providing passenger rail service have significant protections in place to prevent the release of image or audio recordings, but stated that a specific provision, even limited in scope, prohibiting public release would supplement these agencies' existing policies and offer protections where other agencies have no such restrictions in place. The NTSB also commented that it supports FRA ensuring railroads have appropriate limitations established

for the public release of in-cab audio and image recordings.

Under 49 U.S.C. 20168, which governs the installation of audio and image recording devices in passenger train service, Congress has limited the uses to which passenger railroads (49 U.S.C. 20168(d)) and the Secretary of Transportation (49 U.S.C. 20168(h)) can put locomotive image or audio recording device data, including those uses the Secretary deems appropriate under 49 U.S.C. 20168(d)(4). This final rule delineates those allowable uses of both image and audio recording device data in § 229.136(f)(3), and mere public disclosure is not an authorized use.⁴² Indeed, as noted by a commenter, posting on social media websites under the guise of promoting education and safety is not an authorized use, nor can an image or audio recording obtained by a passenger railroad be used to retaliate against an employee.

Further, as provided in § 229.136(f)(2), image or audio recording system data from a locomotive in commuter or intercity passenger service that has been involved in an accident/incident that must be reported to FRA under part 225 of this chapter, can only be extracted and analyzed by the railroad for the purposes described in § 229.136(f)(3). The data cannot be used for any other purpose except by direction of FRA or another Federal agency. Likewise, FRA may not disclose publicly any part of an in-cab audio or image recording or transcript of oral communications by or among train employees or other operating employees responsible for the movement and direction of the train, or between such operating employees and company communication centers, related to an accident or incident investigated by FRA. However, FRA may make public any part of a transcript or any written depiction of visual information that FRA determines is relevant to the accident at the time a majority of the other factual reports on the accident or incident are released to the public.⁴³

⁴² While this rule delineates the allowable uses of image and audio recording device data, FRA notes that a private party may be required to disclose such data in a legal proceeding, such as a civil lawsuit, where the recording may contain probative information.

⁴³ 49 U.S.C. 20168(h). The NTSB restricts the public release of recordings it takes possession of during an investigation until its final report on the accident or incident has been published. However, once the final report has been released, the NTSB does not restrict the owner of any investigative information from publicly releasing that information, including in-cab locomotive recordings.

3. Application to Audio Recording Devices and Their Recordings

APTA separately commented that the requirements of § 229.136(f) pertaining to handling of recordings should not apply to audio recording devices or their recordings, stating that audio requirements were not part of the NPRM, and therefore should not be a part of the final rule. FRA disagrees. Although FRA did not propose in the NPRM and does not require in this final rule the installation of devices to record audio either inside or outside the locomotive cab, passenger railroads that have installed these devices or install these devices in the future must preserve resulting recordings according to the preservation and handling requirements of § 229.136(f)(2), if the locomotive is involved in a reportable accident or incident under 49 CFR part 225. Such information will be relevant to an accident investigation conducted by FRA, the NTSB, or other investigator.

4. Preservation Requirements Between Different Public Agency Rail Owners and Operators

APTA asked how the rule would address a situation where an accident occurs and one public agency owns the rolling stock, but another agency operates the rolling stock. APTA sought clarification as to which entity would be required to preserve the locomotive recording data.

The rule provides that the operating railroad at the time of the accident is responsible for maintaining the data. However, like many issues where there is shared usage of equipment between entities involved in providing passenger rail service, as a practical matter, FRA expects the entities to work such issues out by agreement. Such coordination among the entities involved in providing passenger rail service is also consistent with that expected under the System Safety Program rulemaking, 49 CFR part 270. The entities may mutually agree on fulfilling responsibilities under this final rule on each other's behalf, as tailored to their individual circumstances.

5. Providing Image and Audio Data in a Usable Format

APTA next asked how railroads could provide FRA or the NTSB image or audio data in a usable format when the software required for playback of such data downloaded from a locomotive is contractually controlled by a usage agreement involving the system's original equipment manufacturer (OEM), and the OEM requires each user of the software to sign the user

agreement. APTA asked how this situation would be handled and whether FRA or the NTSB would work directly with the OEM to acquire the software when the railroad has no legal ability to provide the software.

This question is a good example of why FRA is requiring railroads to either provide the image and/or audio data in a readable format, or make available any platform, software, media device, *etc.*, that is required to play back the image and/or audio data. FRA believes that whatever software the railroad uses could be put into a free format. The time to make a format change would be considered to be *de minimis*. FRA has found its accident investigations hindered when the recording devices used by passenger railroads were not in a usable format or the platform, software, or media device required the purchase of a system to play the image and/or audio data. It is not in the public's interest to inhibit FRA's use of locomotive image or audio recordings because they are in a format not readily accessible without the purchase of a unique program or other software or equipment from a private manufacturer. Therefore, it is FRA's intention through this final rule that the locomotive recording device record image or audio data be in a readily accessible format, or the railroad provide the program or other software or equipment so the locomotive recording can be accessed.

As noted above, entities providing passenger rail service may contract with other parties to fulfill the requirements of this rule and may therefore enter into agreements with manufacturers to develop their locomotive recording systems. FRA will not provide specific guidance on how the procurement and bidding process for such technology should be managed other than to reiterate FRA's concern as to the accessibility of the locomotive recording device data. Unless the recordings are in a readily available format for investigators to use, the post-accident value of the recordings and the accident investigations themselves may be impaired.

6. Permissible Uses for Locomotive Recording Devices

i. FRA Should Only Set Minimum Safety Requirements

APTA opposed FRA specifying in the NPRM permissible uses for locomotive recording device technology, asserting that the final rule should only set minimum safety requirements. APTA stated FRA should either not adopt such a proposal or instead take a broader approach that allows passenger

railroads to develop their own uses for safety and security purposes. APTA cited to the experience railroads have using such data for several purposes, including investigating accidents. APTA added that allowing passenger railroads to use their locomotive image and audio recording devices to monitor locomotive cabs for unauthorized occupancy should be deleted as it could be interpreted as a requirement to use remote monitoring, which is not practical for the passenger railroad industry which operates thousands of trains a day.

FRA is adopting the permissible uses for locomotive recording devices as proposed. The Statute enumerates certain purposes for which passenger railroads may use locomotive recording device data and authorizes FRA, as the Secretary's delegate, to provide for other appropriate purposes.⁴⁴ Therefore, it would be contrary to the Statute to let passenger railroads set such purposes. Further, the provision allowing railroads to use recorder data to monitor unauthorized occupancy of the lead locomotive cab or cab car operating compartment comes directly from the Statute.⁴⁵

The final rule does not require passenger railroads to remotely monitor their locomotives for unauthorized occupancy, though it allows passenger railroads to use their recording device data to do so. For further discussion on remote monitoring, please see Section II.G.

ii. Application to Freight Locomotive Recording Devices

In its comments, BLET stated that the permissible uses for locomotive recording device technology should apply to both passenger and freight railroads that voluntarily install locomotive recording devices. BLET further suggested that such a uniform set of standards and requirements provide for the encryption of image and voice recordings and access only by authorized personnel, to safeguard the identities of the recorded individuals. Moreover, in the event that surveillance data is used in disciplinary and/or certification revocation proceedings, BLET asserted that the identities of those who decrypt the data should be made known to the labor organizations representing the charged employees, and that such persons be made to testify as a witness at any discipline or revocation hearing, if requested by the labor organizations.

In addition, BLET commented that, in the NPRM, FRA repeated a

misperception of what cameras can do to promote safety by asking whether there are other safety-appropriate uses for locomotive recordings. According to BLET, cameras provide no protection against accidents that would happen within an operational envelope, and do not prevent electronic device usage. BLET questioned what safety goal is achieved when a personal electronic device is found through locomotive recording data, when the recording itself could not prevent it. BLET also questioned the extent to which locomotive recording data in post-accident analysis can actually help in day-to-day operations. Overall, BLET believed locomotive recorders will serve only to document a problem someone already knew existed and negligence over time, but that safety will not improve as a result if the underlying issue is not addressed.

As previously noted, FRA lacks the justification to apply the requirements for permissible uses of locomotive recording device technology in this final rule to freight railroads, in accordance with FRA's implementation of the Statute. However, it is FRA's expectation that all railroads that voluntarily install recording devices on their locomotive will adhere to practices that are consistent with those in this final rule. In addition, BLET's suggestion to encrypt all locomotive recording data would unnecessarily increase the cost of this rulemaking, although FRA expects that encryption technology or equivalent data protection measures will be used, given the requirements in this final rule that such data may only be accessed by authorized personnel and its integrity be safeguarded against unauthorized download, deletion, or alteration. Finally, although FRA agrees that most of the benefits of this rulemaking will come from enhancing post-accident analysis through the information contained in locomotive recordings, FRA strongly disagrees that locomotive recording devices will provide no deterrence against personal electronic device use or other safety violations occurring during railroad operations. FRA also notes that, as identified by Congress, the recordings may serve to document a criminal act or monitor unauthorized occupancy of a locomotive.⁴⁶

U. Factual Determinations When There Are Discrepancies Between Locomotive Image and Event Recorder Data

APTA commented that the NPRM did not address a situation where data from

⁴⁴ 49 U.S.C. 20168(d).

⁴⁵ *Id.*

⁴⁶ 49 U.S.C. 20168(d)(3).

a locomotive image recorder and an event recorder do not match and asked FRA which of the two devices will be determinative for factual considerations. FRA expects that any such discrepancies will be addressed on a case-by-case basis as part of the investigation following an accident or incident, taking into account the totality of the circumstances. This final rule does not make the data from one device primary over the other.

V. Personal Electronic Device Use and Locomotive Recording Devices

FRA discussed extensively in the NPRM how concerns about preventing accidents caused by distraction involving the use of personal electronic devices was one of the bases for this rulemaking, as well as the focus of NTSB recommendations and RSAC Working Group discussion. As a result, FRA received several comments about locomotive recording devices and how they would deter crewmembers from using personal electronic devices while performing safety sensitive service.

BLET commented that locomotive cameras will not deter negative behavior involving crewmembers or personal cell phone usage. BLET asserted that evidence shows individuals continued to use their personal phones when locomotive cameras were present, and that locomotive cameras will just show the behavior, which is already known to exist.

BLET also commented that FRA did not include a discussion in the NPRM on technology that can disrupt cell phone connectivity. BLET stated it partnered with Amtrak on a project that demonstrated the utility of technology that would both intercept cell phone connectivity outside of the locomotive and alert designated supervisors in real time of any attempt to use a cell phone. BLET found this to be a significant safety enhancement at relatively low cost, one that operates far less intrusively than inward-facing locomotive cameras, and noted that this technology was not mentioned in the NPRM as a potential “alternative technology.”

Wi-Tronix commented that major passenger train incidents over the past decade proved that distracted driver operation is a critical problem and that technology also exists to monitor such activity in locomotive cabs. Wi-Tronix stated that the integration of image and audio recording data and the detection of such data in cellular logs, when integrated and synchronized with event recorder data, make an extremely powerful tool for accident/incident investigation and to influence behavior.

While BLET is correct that the presence of inward-facing locomotive recording devices will not entirely prevent the usage of personal electronic devices when performing safety-sensitive service, the presence of these devices will nonetheless provide a deterrent effect. FRA found a study by the Virginia Tech Transportation Institute that examined the change in commercial truck driver behavior when an image recording device was within the cab of the vehicle.⁴⁷ The study found that the two carriers which participated experienced a 27 percent and 52 percent reduction in human factor events per miles traveled, respectively.⁴⁸ While these results cannot be applied directly to the railroad industry, the study provides additional evidence that locomotive image recording devices can alter operator behavior, and thus reduce human factor accidents. However, as noted within the Virginia Tech study, any altering of operational behavior is most likely to be more prominent at the beginning of the observation period, and behavior could revert as time passes. Further, the presence of locomotive recording devices will help FRA and railroads identify individuals who violate Federal regulations against personal electronic device usage in part 220, subpart C, and various other railroad operating rules prohibiting cell phone usage.

Moreover, aside from the deterrent effect locomotive recording devices have in preventing personal electronic device usage, the recording devices provide other important safety functions unrelated to personal electronic device usage. For example, one of the primary functions of locomotive recording devices is to provide information as to the causes(s) of a railroad accident or incident. Therefore, although FRA encourages the use and development of technology to promote safety, the technology described by the commenters to detect or prevent personal electronic device usage cannot be considered an “alternative technology” for purposes of the statutory requirement to install inward- and outward-facing locomotive image recorders.

W. Positive Train Control

Railroad carriers providing “intercity rail passenger transportation” and

⁴⁷ Hickman, Jeffrey S., Richard J. Hanowski, and Olu Ajayi. *Evaluation of An Onboard Safety Monitoring Device In Commercial Vehicle Operations*. Report. Federal Motor Carrier Safety Administration, Virginia Tech Transportation Institute (2009).

⁴⁸ *Id.*

“commuter rail passenger transportation” subject to this final rule are covered by 49 U.S.C. 24102 (passenger railroads required to install PTC systems under 49 U.S.C. 20157(a)). Although FRA did not specifically request comments on PTC, FRA received several comments relating to PTC technology, the nature of the overlap between passenger railroads required to install PTC and locomotive image recording devices, and the interaction between locomotive recording devices and PTC systems. Specifically, commenters asserted that passenger railroads should not be required to divert resources from installing, maintaining, and operating PTC systems to address the recording device requirements in this rulemaking.

APTA cited the accidents and associated NTSB recommendations discussed in the NPRM and stated that almost every one of the accidents would have been prevented by a functioning PTC system. In addition, APTA stated that most were accidents involving freight trains, not passenger trains.

Hitachi agreed with APTA that all the accidents discussed in the NPRM were arguably PTC-preventable accidents. Hitachi believed that, although image recording devices could prove useful as accident investigation tools in the future, accident prevention should currently be the primary focus and, as a result, railroads should not divert valuable resources from operating and maintaining PTC equipment “to meet well-intentioned, but misguided FRA mandates.”

BLET also took issue with the accidents FRA discussed in the NPRM. BLET pointed out that two of the accidents, the 2008 accident in Chatsworth, California, and the 1999 accident in Bryan, Ohio, led to the NTSB recommending both the installation of PTC and the installation of locomotive image recording devices. According to BLET, the NTSB stated that PTC could have prevented these accidents from occurring. Therefore, BLET questioned why locomotive image recording systems would be appropriate where PTC is installed and operating, except perhaps to use outward-facing cameras to document signal visibility due to dense fog, which was at issue in the Bryan, Ohio, accident.

Additionally, FRA received a comment from a private citizen who stated that outward-facing locomotive recording devices offer no preventative qualities. The commenter believed that resources dedicated to outward-facing recording systems detract from finite resources available for safety, installing a form of PTC technology would be a

much better use of those resources, and that this final rule should not be adopted until PTC technology is installed on all rail miles.

FRA understands the concerns raised by commenters and does not dispute the commenters' assertion that many, if not all, of the accidents cited in the NPRM could have been prevented by the implementation of PTC systems, nor does FRA dispute the safety benefits of PTC systems. However, PTC is not an adequate "alternative technology" under the Statute, as PTC and locomotive recording devices serve different safety functions. PTC is designed to prevent certain accidents, and, although locomotive recording devices do have the potential to help prevent accidents, one of the main purposes of locomotive recording devices is to record information to provide to investigators after an accident or incident has occurred.⁴⁹ The information recorded by the recording devices cannot normally be provided by the PTC system, or other similar technology.

All PTC systems must be designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zones, and movement of trains through switches left in the wrong position, in accordance with the requirements of 49 CFR part 236, subpart I. As touched on above, one of the primary uses of locomotive recording devices is for investigating railroad accidents or incidents caused by human factors where standard event recorders can provide little or incomplete information about what occurred in the locomotive cab prior to the accident or incident.⁵⁰ PTC may be able to provide some information, but not a full accounting of the train crew's actions immediately before an accident. Therefore, PTC is not an adequate technology to replace the locomotive recording device requirements in the Statute.

As previously stated, the Statute requires the promulgation of regulations requiring passenger railroads to install recording devices in all controlling (or "lead") locomotives. When the locomotive recording devices statutory

mandate was enacted, the statutory mandate to implement PTC on passenger railroads had long been in place.⁵¹ In fact, between Congress' initial PTC mandate in 2008 and the Statute in 2015, Congress continued to be actively engaged in PTC policymaking through legislation and other activities. Congress held multiple oversight hearings about the technology and passed another piece of PTC legislation approximately five weeks prior to the passage of the Statute. It is clear that Congress passed the locomotive recording devices mandate for passenger trains with the awareness that the same passenger railroads would also be required to install PTC systems. As a result, FRA does not believe Congress intended PTC systems to be considered an "alternative technology" under the Statute that would excuse passenger railroads from implementing locomotive recording devices.

X. Locomotive Image Recorder Analytics

Wi-Tronix commented that data created by locomotive image recorders will need to be accessed for artificial intelligence and image analytics purposes, stating that artificial intelligence and image analytics are key elements to improving industry safety, as seen in the automotive industry. As a result, Wi-Tronix asserted there needs to be a mechanism to allow for sharing anonymous data for use in improving safety and operations.

FRA declines to develop a mechanism in this rule for sharing anonymous data from locomotive image recording devices. The Statute did not mandate the establishment of such a mechanism, and FRA expects that passenger railroads would be reluctant to share the data due to the need to address proprietary, liability, privacy and other potential issues and concerns. Although FRA strongly supports the use of data to promote safety purposes, this final rule is not the appropriate forum for imposing such a requirement, consideration of which would require the involvement of all stakeholders. See also the discussion under Section II.L.5 above, noting that this final rule will not affect the adoption of C3RS programs, which allow railroad employees to raise safety incidents confidentially and generate reports based on such incidents without identifying data.

Y. Procurement of Locomotive Recording Devices

Hitachi commented that FRA should investigate and suggest updates for procurements, to favor transit agencies,

considering the best technology or exploring the most advanced technological applications. FRA declines to adopt this suggestion, as it is beyond the scope of this rulemaking. FRA's purpose in this final rule is to implement the statutory mandate to establish minimum standards for inward- and outward-facing locomotive image recording systems for passenger railroads. Railroads may, of course, exceed these minimum standards and work together in procuring and applying the technology, including the development of industry specifications and best practices consistent with this rule.

Z. Application of the Rule to GP-Style Long-Hood Locomotives

APTA provided a comment specific to commuter railroads that utilize some general purpose (GP)-style locomotives with one cab only on the short-hood end, and a narrow car body on the long-hood end. These locomotives can operate in the lead with the long- or short-hood forward while in revenue service. APTA sought clarification whether the long-hood of these locomotives must comply with the final rule, even if operated only occasionally long-hood forward, and believed that such use should be excluded by the final rule.

FRA disagrees with APTA's comment that these locomotives should be excluded from the final rule's requirements. If a railroad operates such locomotives long-hood forward in regularly scheduled passenger service, however occasionally the locomotive configuration may be used, the long-hood must be equipped with an outward-facing image recording device in the direction that the locomotive is traveling. FRA disagrees with APTA, in part, because an exclusion could incentivize use of locomotives in this configuration. FRA addresses the costs associated with long-hood forward use of locomotives in this final rule's RIA by increasing the number of impacted locomotives affected by the final rule.

AA. Inclusion of Passenger Railroad Cab Cars in the Rule's Requirements

Wi-Tronix, believing that passenger railroad cab cars may not be locomotives, commented that it would be critical that cab cars be covered by this final rule's requirements applicable to locomotives. FRA makes clear that cab cars are indeed locomotives subject to this final rule. Cab cars are formally recognized by the existing definition of "control cab locomotive" in § 229.5 to mean a "locomotive."

⁴⁹ See 49 U.S.C. 20168(d)(2) (Railroad carriers subject to the Statute may use recordings from inward- or outward-facing image recording devices for "[a]ssisting in an investigation into the causation of a reportable accident or incident").

⁵⁰ See also 49 U.S.C. 20168(d)(1) (Railroad carriers subject to the Statute may use recordings from inward- or outward-facing image recording devices for "[v]erifying that train crew actions are in accordance with applicable safety laws and the railroad carrier's operating rules and procedures, including a system-wide program for such verification").

⁵¹ See 49 U.S.C. 20157(a).

III. Civil Penalties

FRA did not request or receive any comments regarding the potential civil penalties FRA could issue for violations of new or amended requirements in this final rule. FRA will modify the schedule of civil penalties on its website⁵² to reflect the requirements of the final rule. Because such penalty schedules are statements of agency policy, notice and comment are not required before their issuance, and FRA did not propose a penalty schedule in the NPRM.⁵³

FRA is authorized to assess a civil penalty of at least \$976 and not more than \$31,928 per any violation of the requirements established in this final rule.⁵⁴ However, penalties up to \$127,712 may be assessed for a grossly negligent violation or a pattern of repeated violations that created an imminent hazard of death or injury to individuals, or has caused death or injury.⁵⁵ In accordance with the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015, these minimum and maximum penalty amounts will be adjusted for inflation in the future.

IV. Discussion of Amendments to Part 299 Pertaining to Texas Central Railroad Trainset Image Recording Systems

Texas Central Railroad (TCRR) intends to implement a high-speed passenger rail system by using the Tokaido Shinkansen system's service-proven technology and by replicating Central Japan Railway Company's (JRC) operational and maintenance practices and procedures. The contemplated system will run between Dallas and Houston, Texas, with an intermediate stop in Grimes County, Texas, approximately 240 miles, at a speed not to exceed 205 mph. TCRR plans to implement the latest, service-proven derivative of the N700 trainset and other core systems currently in use on the Tokaido Shinkansen line, which have been refined for high-speed operations over the last 50-plus years.

On November 3, 2020, FRA published a final rule establishing regulatory requirements applicable only to TCRR—a rule of particular applicability (RPA).⁵⁶ Such a regulation, in addition to providing for regulatory approval, institutes a comprehensive regulatory framework that provides TCRR clarity

on the minimum Federal safety standards that it must comply with through technology-specific, performance-based requirements. Through the RPA, FRA is able to protect the integrity of the Tokaido Shinkansen system as implemented in Texas, by establishing regulatory requirements codifying the service-proven technological, operational, and maintenance aspects of the Tokaido Shinkansen high-speed rail system operated by JRC.

On March 10, 2020, FRA published an NPRM proposing a set of safety requirements for TCRR (the TCRR NPRM). FRA proposed to make FRA's regulation implementing section 11411 of the FAST Act applicable to TCRR's high-speed trainsets used in revenue service.⁵⁷ However, the TCRR final rule was published before this final rule implementing section 11411 of the FAST Act. Accordingly, FRA noted in the TCRR final rule that it would make revisions to the TCRR final rule as part of this final rule.⁵⁸ The amendments to § 299.5 adopted in this final rule and new § 299.449 reflect these revisions.

During the 77-day comment period on the TCRR NPRM, FRA received comments from TCRR on the topic of locomotive image recorders. TCRR requested that FRA exercise its statutorily granted discretion under 49 U.S.C. 20168(e)(2) and exempt TCRR from the requirement to install inward- and outward-facing image recording devices, asserting that TCRR will implement an alternative technology or practice that provides an equivalent or greater level of safety or is better suited to the risks of the operation. In support of its request, TCRR stated that such alternative technologies or practices to be employed include: a signaling system that will comply with the requirements for PTC under 49 U.S.C. 20157 and be installed throughout the TCRR system (including trainset maintenance facilities) and used at all speeds; a dedicated, fully fenced (except for elevated structures), grade-separated right-of-way; an intrusion detection system; a right-of-way barrier plan to protect against unauthorized incursions into the right-of-way and from adjacent highway and freight rail operations; and wind, rain, and flood hazard detectors located at specific sites along the right-of-way.

FRA recognizes and appreciates the mitigations that TCRR will have in place under part 299 and that those

mitigations are modeled on the very successful Tokaido Shinkansen system. However, even with all the mitigations TCRR is putting in place to avoid any form of accident/incident, it is in the interest of railroad safety to require TCRR to install image recording systems in its high-speed trainsets. Notably, should an event occur despite the mitigations put in place by the railroad, it will be even more crucial to have imagery from the recording system to determine how the event occurred and/or what was occurring in the controlling cab of the trainset in the time before and during the event. See also the discussion under Section II.W of this final rule, noting that FRA cannot consider PTC an adequate "alternative technology" to installation of inward- and outward-facing image recording devices for purposes of the statutory exemption. Accordingly, TCRR is not exempt from the requirement to install inward- and outward-facing image recording devices.

Contrary to the discussion in the TCRR NPRM, in which FRA stated it would make appropriate conforming changes to the requirements outlined in the NPRM, essentially making the requirements of § 229.136 applicable to TCRR, FRA is adding § 299.449 to part 299 to contain the specific requirements for the image recording system applicable only to TCRR.⁵⁹ Placing the requirements that are specific to TCRR in part 299 allows FRA to properly tailor the requirements to the TCRR system and operation.

Section 299.449, as adopted in this final rule, reflects FRA's efforts to tailor the locomotive image recorder requirement to TCRR's equipment and operation and to address TCRR's comments. Section V, Section-by-Section Analysis, below, contains a discussion of the changes made and codified under §§ 299.5 and 299.449, and under appendix A to part 299, Criteria for Certification of Crashworthy Event Recorder Memory Module. FRA has made both editorial and substantive changes in applying the rule text in § 229.136 and appendix D to part 229 to TCRR's rule of particular applicability, part 299. The changes ease understanding of the various requirements, as applied to TCRR, including clarifying whether a requirement pertains to a component of the image recording system (such as an

⁵² www.railroads.dot.gov.

⁵³ See 5 U.S.C. 553(b)(A).

⁵⁴ See 87 FR 15839 (Mar. 21, 2022).

⁵⁵ See *Id.*

⁵⁶ See 85 FR 69700 (Nov. 3, 2020).

⁵⁷ See 85 FR 14036, 14041 (Mar. 10, 2020); see also 84 FR 35712 (Jul. 24, 2019).

⁵⁸ See Section V.C, Trainset Image Recording System, of the TCRR final rule, 85 FR 69700, 69714.

⁵⁹ The TCRR final rule explained that, because the image recording device rulemaking was not finalized at the time the TCRR rule was finalized, FRA would "make any necessary changes to [the TCRR] regulation as a part of" the image recording device final rule. 85 FR 69700, 69715 (Nov. 3, 2020).

image recording device) or whether a requirement pertains to the image recording system as a whole. The substantive changes were made to tailor the rule text appropriately for TCRR's system.

V. Section-by-Section Analysis

This section responds to public comments and identifies any changes made from the provisions as proposed in the NPRM. Provisions that received no comment, and are otherwise being finalized as proposed, are not discussed again here.⁶⁰

Amendments to 49 CFR Part 217

Section 217.9 Program of Operational Tests and Inspections; Recordkeeping

In this final rule, FRA is clarifying its intent to exclude freight railroads from these requirements by using the term "passenger railroad," instead of "railroad," throughout paragraphs (b)(3) and (4).

FRA is also adding audio recordings to paragraph (b)(3)(iii). Although proposed paragraph (b)(3)(iii) did not expressly mention audio recordings as subject to the 72-hour limitation on operational tests or inspections after completion of the employee's tour of duty, the omission of audio recordings was inadvertent and not consistent with proposed paragraph (b)(3) as a whole. For instance, proposed paragraph (b)(3)'s introductory text made clear that operational tests and inspections involving inward-facing image or in-cab audio recordings must comply with the conditions in paragraphs (b)(3)(i), (ii), and (iii). Further, it would not make sense for FRA to require passenger railroads to select testing subjects at random for operational testing involving inward-facing locomotive image recordings, but allow the potential for specific employees to be targeted for operational testing with audio recording devices. Therefore, FRA is correcting the inadvertent omission in this final rule. Accordingly, while the final rule does not require passenger railroads to install audio recording devices of any kind, if passenger railroads choose to install such devices and then use them for operational testing, the same protections for operational testing and use of image recorders also apply for operational testing and use of audio recorders.

Amendments to 49 CFR Part 218

Section 218.53 Scope and Definitions

FRA is revising paragraph (d) of this section to make clear that the provisions

in §§ 218.59 and 218.61 do not apply to locomotive-mounted image or audio recording equipment on freight locomotives. FRA's use of "or," instead of "and" as proposed in the NPRM, is to avoid the potential ambiguity that both image and audio recording equipment on a freight locomotive must be present for the exclusion to apply. It is FRA's intention that §§ 218.59 and 218.61 will not apply to either type of recording device on a freight locomotive, whether alone or in combination.

Section 218.61 Authority To Deactivate Safety Devices

FRA is also revising subsection (c) of this section to read that the requirements of this section do not apply to inward- or outward-facing image recording devices that are installed on freight locomotives, instead of inward- and outward-facing image recording devices on freight locomotives. Like its revision in § 218.53, FRA is substituting the word "and" with "or" to avoid the potential ambiguity that both an inward- and outward-facing image recording device must be present on a freight locomotive to avoid the application of this section, when the presence of either an inward- or outward-facing image recording device is sufficient to avoid the section's requirements.

Amendments to 49 CFR Part 229

Section 229.5 Definitions

Although proposed in the NPRM, FRA is not amending this section to add a definition for "NTSB" as the acronym for the National Transportation Safety Board, an independent U.S. government investigative agency responsible for civil transportation accident investigation. The term is not used in any of the amended or new language being added to part 229 by this final rule.

Section 229.21 Inspections and Tests

FRA is making conforming changes to § 229.21 to reflect the allowance for movement beyond a calendar day inspection point of a lead locomotive in long-distance intercity passenger train service with a locomotive image recorder system or device defect. See the discussion in the Section-by-Section analysis of § 229.136, below, as well as Section II.I (Repairing, Replacing, or Removing Locomotive Image Recording Devices From Service) within the Discussion of Specific Comments and Conclusions, above. Although not expressly proposed in the NPRM, these changes are limited only to such long-

distance intercity passenger trains led by locomotives subject to this final rule's locomotive image recorder requirements—and only to the handling of such locomotive image recording systems or devices. FRA intends no other changes to this section's application or effect.

Section 229.22 Passenger Locomotive Inspection and Repair Record

FRA has added this section in preparing the final rule to establish use of new Form FRA F 6180-49AP (Passenger Locomotive Inspection and Repair Record) to collect Federally required locomotive inspection, testing, and repair information for lead locomotives in commuter or intercity passenger train service, including information for locomotive recording devices. This new form is based on existing Form FRA F 6180-49A (Locomotive Inspection and Repair Record), which has been used for many years as the centralized record of Federally required inspection, testing, and repair information for all locomotives, as defined broadly in § 229.5. Form FRA F 6180-49AP, as the new counterpart to Form FRA F 6180-49A, will include a designated row for entering information about annual testing of locomotive image recording devices required under § 229.136, consistent with the designated row on Form FRA F 6180-49A (as well as new Form FRA F 6180-49AP) for entering information about required locomotive event recorder testing. Form FRA F 6180-49AP will also continue to be organized to fit on one double-sided page, for ease of use and printing and copying.

Establishing use of the new F 6180-49AP form for lead locomotives in commuter or intercity passenger train service will help avoid any potential confusion for freight railroad operators as to the application of locomotive recording device requirements under this rule, and also conserve valuable space on the existing F 6180-49A form. Freight railroads operate the vast majority of locomotives, and the locomotive recording device requirements in this rule do not apply to locomotives in freight service, or to locomotives used in switching service. Nor will the rule affect use of the F 6180-49A form by non-lead locomotives in commuter or intercity passenger train service.

To phase-in use of new Form FRA F 6180-49AP for lead locomotives in commuter or intercity passenger train service, § 229.22 expressly permits continued use and maintenance of Form FRA F 6180-49A until October 12,

⁶⁰ 84 FR 35,712.

2027, when all such locomotives will be required to be equipped with image recording devices compliant with § 229.136. In providing broad flexibility, § 229.22 also makes clear that railroads may adopt use of Form FRA F 6180–49AP earlier than required.

Section 229.136 Locomotive Image and Audio Recording Devices

FRA is making changes in this section's regulatory text from the NPRM. In various paragraphs, the changes remove redundant words or phrases from the proposed language to streamline the final rule. Where these and other purely stylistic textual changes do not modify the meaning or requirements of the paragraphs or this section, they will not be addressed in the analysis below.

FRA is modifying the headings for paragraphs (b), (c), (d), and (e) by inserting the word "lead" into each paragraph heading, to clarify that only passenger locomotives in the lead position must comply with these paragraphs' requirements. FRA is also adding clarifying text to avoid any confusion as to the applicability of this section's requirements to recording devices or systems voluntarily installed in locomotives. FRA has therefore inserted "as required under paragraph (a)(1) or (2) of this section" to make clear that the corresponding text applies only to locomotives required to be equipped with recording devices or systems under paragraph (a)(1) or (2) of this section.

In paragraph (a)(3), FRA has changed the name of the form referenced in this paragraph from "Form FRA F 6180–49A" to "Form FRA F 6180–49AP," as FRA has created this new form specifically for passenger locomotives subject to the requirements in this final rule. Passenger railroads must still note the presence of any image or audio recording system in the REMARKS section; however, passenger railroads must use new Form FRA F 6180–49AP for their lead locomotives used in commuter or intercity passenger train service.

In paragraph (a)(5), FRA is adding language making clear that locomotive recording device data can be stored on a certified crashworthy event recorder memory module or an alternative, remote storage system that provides equivalent data protections if approved by FRA. See Section II.E.2 (Potential Exemptions From the Crashworthy Memory Module Requirements) for a detailed discussion of FRA's considerations in approving a remote storage system as part of the locomotive recording system approval process. FRA

has added paragraphs (a)(5)(i) and (ii) to clarify when required image recording and voluntarily installed audio recording devices on lead locomotives must comply with the paragraph's requirements. Paragraph (a)(5)(i) references paragraphs (a)(1) and (2) for when image recording devices on lead locomotives must comply with this paragraph's requirements, while paragraph (a)(5)(ii) specifies when voluntarily installed audio recording devices on lead locomotives must comply with the same requirements. FRA added these paragraphs because the NPRM was unclear when voluntarily installed audio recording devices on lead locomotives in commuter or intercity passenger service would be required to record their data to a certified crashworthy event recorder memory module or FRA-approved remote storage system.

FRA is not adopting the language proposed in paragraph (c)(1)(i) specifying that the locomotive inward-facing camera system have sufficient resolution to record whether a crewmember is physically incapacitated and whether a crewmember is complying with the indicators of a signal system or other operational control system. Instead, FRA is simply retaining the requirement that the inward-facing camera system have sufficient resolution to record crewmember actions, without the more prescriptive language. FRA reiterates that this paragraph does not require the real-time monitoring of passenger train crews. Please see the above discussion in Section II.G (Inward-Facing Locomotive Image Recording Systems and Devices).

FRA is also renumbering paragraph (c) for clarity. The proposed regulatory language in paragraph (c)(1)(ii) is now contained in paragraphs (c)(1)(ii) and (iii) in this final rule. Similarly, the regulatory language in proposed paragraphs (c)(2), (3), and (4) is now found in paragraphs (c)(1)(iv), (2), and (3), respectively. In addition, FRA is adding the phrase "on image recordings" in paragraph (c)(1)(iv) for clarity.

FRA is modifying and broadening paragraph (d) from the proposal in the NPRM to make clear that, in addition to unauthorized downloads, passenger railroads must also take necessary protective measures against unauthorized access to the recording system and its recordings that could lead to the deletion or alteration of data. Likewise, paragraph (d)'s heading now refers to "protection requirements," rather than "download protection requirements," to make clear this

paragraph's requirements address measures to protect the integrity of the recording system more than just protecting against unauthorized downloads. In addition, as stated above in Section II.R (Download and Security Features of Locomotive Recording Systems), the reference to standard memory modules in this paragraph was proposed in error and has not been retained.

FRA is also adding paragraphs (d)(1) and (2) to clarify when required image recording and voluntarily installed audio recording devices on lead locomotives must comply with paragraph (d)'s requirements. Paragraph (d)(1) includes requirements for image recording devices on lead locomotives, while paragraph (d)(2) addresses requirements for voluntarily installed audio recording devices on the same locomotives. The language FRA is adopting in paragraphs (d)(1) and (2) is nearly identical to that which FRA is adopting in paragraphs (a)(5)(i) and (ii). Similar to those new paragraphs, which are discussed above, FRA is adding these paragraphs to paragraph (d) because the NPRM was unclear when voluntarily installed audio recording devices on lead locomotives in commuter or intercity passenger service would have to meet the paragraph's requirements.

In paragraph (e), FRA is modifying paragraph (e)(1) so that it directly references the requirements in paragraph (i) for the removal from service and handling for repair of inward- and outward-facing image recording systems. FRA had initially proposed referencing the daily inspection requirements in § 229.21 (Daily inspection). However, as discussed in Section II.I (Repairing, Replacing, or Removing Locomotive Image Recording Devices From Service), FRA has modified the requirements for the removal from service and handling for repair of inward- and outward-facing image recording systems on long-distance intercity passenger trains, as specified in paragraph (i) of this section.

FRA is also modifying paragraph (e)(2)'s requirements based on comments it received, which are discussed above in Section II.S (Self-Monitoring and Self-Reporting Systems or Devices on Locomotive Image Recording Systems). Specifically, paragraph (e)(2) makes clear that the required sample download(s) must be taken directly from the image recording system's crashworthy memory module, or FRA-approved remote storage system, to confirm proper operation of the system. Paragraph (e)(2) also now provides for taking the required sample

download(s) during a locomotive's annual test required under § 229.27, Annual tests.

Information concerning the results of this annual test must be entered on new Form FRA F 6180-49AP in a row specifically dedicated for this purpose. The added row on the new form parallels, and is directly below, the row for entering information concerning the results of event recorder tests required by §§ 229.25(d) and 229.27(c), and provides for entering the same information as for other required tests.

In paragraph (f), the exception to a railroad's use of image or audio recording device data in paragraph (f)(2)(ii) applies by direction of FRA or "another Federal agency," including but not limited to the NTSB. This change is consistent with the use of similar forms of "another Federal agency" throughout paragraph (f)(2) and clarifies that another Federal agency is not limited to the NTSB. FRA is also modifying the language in paragraph (f)(3)(vii) to make clear that a railroad may perform inspection, testing, maintenance, or repair activities on an "image or audio recorder," and not only an "inward-facing image recorder" as stated in the NPRM, to ensure proper installation and functioning. Passenger railroads may of course perform such activities on inward- or outward locomotive image or audio recording devices at any time.

In paragraph (g), FRA is requiring a "description" of the technical aspects of any locomotive image recording system intended to comply with this section, rather than a "written description" as proposed in the NPRM. In addition, paragraph (g) specifies an email address rather than a mailing address for submitting the description to FRA. FRA has made these changes to encourage and promote the electronic submission of the information to FRA. This final rule also clarifies that railroads should submit to FRA a description of the technical aspects of any locomotive image recording system "intended" to comply with the section, rather than after a recording system has been "installed," as stated in the NPRM. FRA revised this language as it is rational that railroads would seek FRA's approval of their locomotive image recording systems before spending money to install a potentially non-approved system on their locomotives.

Further, FRA is correcting paragraph (g)(2)'s submission date requirements, to address an inadvertent error in the proposed rule, and also modifying paragraph (g)(3) to make clear that FRA must review a railroad's submission and approve any locomotive image recording system before the system can

be installed or put into service in compliance with this section. Please see Section II.J (FRA Approval Process for Locomotive Image Recording Systems and Devices) above, for more detailed discussion of these revisions.

In paragraph (i), FRA is inserting the word "alone" into the regulatory text to clarify that a locomotive with only an out-of-service image recording device is not considered to be in an improper condition, unsafe to operate, or a non-complying locomotive under §§ 229.7 and 229.9. However, as unchanged from the NPRM, paragraph (i) also makes clear that a railroad must remove the device from service if the railroad knows the device is not properly recording. Further, when a railroad removes a locomotive image recording device from service, a qualified person must record the date the device was removed from service under the REMARKS section of Form FRA F 6180-49AP—not Form FRA F 6180-49A. For a more extensive discussion of this requirement, please see Sections II.H (Notice Provided When Locomotive Recording Devices Are Present) and II.I.3 (Documenting When a Locomotive Image Recording Device Has Been Removed From Service), above.

In addition, except for long-distance intercity passenger trains, a locomotive with a defective image recording device may remain as the lead locomotive only until the next calendar-day inspection required under § 229.21. This includes a lead locomotive in a commuter train with an image recording device found defective at an outlying inspection point, which may remain as the train's lead locomotive only until the next calendar-day inspection required under § 229.21. As discussed above in Section II.I (Repairing, Replacing, or Removing Locomotive Image Recording Devices From Service), FRA has expanded the movement-for-repair allowance for a long-distance intercity passenger train's lead locomotive with a defective image recording device so that it may remain as the lead locomotive until arrival at its destination terminal or its nearest forward point of repair, whichever occurs first.

FRA notes that the rule does not specify how a railroad shall indicate on the F 6180-49AP form when a locomotive image recording device is returned to service. This is intended to provide railroads the flexibility to denote this information in the REMARKS or the REPAIRS section of the F 6180-49AP form, or in an equivalent location.

FRA is adding paragraph (l) to exclude from compliance with the requirements of this section freight

locomotives acting as passenger locomotives when they are performing rescue operations for intercity or commuter passenger trains. Please see the above discussion in Section II.A.3 (Application of Requirements to Freight Locomotives Performing Rescue Operations).

Finally, FRA is revising the introductory paragraph of appendix D to part 229 to clarify that data from image and voluntarily-installed audio recording systems must be recorded on a certified crashworthy memory module or on an alternative, remote storage system that provides equivalent data protections and is approved by FRA.

Amendments to 49 CFR Part 299

Section 299.5 Definitions

Consistent with the revisions made to part 229 in this final rule, FRA is adding three new definitions to part 299: "Event recorder memory module", "Image recording system", and "Recording device". These define key components of what comprises the image recording system and are substantively similar to the definitions of the same terms in § 229.5. The definitions in part 299 differ only slightly from those in part 229 to reflect editorial revisions to harmonize the definitions with the rest of part 299.

Section 299.449 Trainset Image and Audio Recording System

Section 299.449 is based on § 229.136. Similar to § 229.136, FRA is requiring all TCRR high-speed passenger trainsets used in revenue service to be equipped with an image recording system as described under § 299.449 prior to commencing revenue operations. However, because TCRR is not yet operating, it does not need to avail itself of an implementation period for this requirement, as in § 229.136(a), and FRA has not included one.

As provided in § 229.136(a)(3), if a locomotive is equipped with an image or audio recording system, that fact must be annotated on the locomotive's Form FRA F 6180-49AP. FRA is not including this annotation requirement in § 299.449, however, as TCRR is not required to use Form FRA F 6180-49AP.

FRA has also revised the language in § 299.449(a)(4) to clarify that TCRR's locomotive image recording device data must be recorded on either a certified crashworthy memory module or an alternative, remote storage system that provides at least equivalent data protections and has been approved by FRA under § 299.449(g).

In commenting on the TCRR NPRM, TCRR stated that the resolution

requirements for both outward- and inward-facing image recording devices proposed in § 229.136(b) were quite prescriptive and should be reexamined for high-speed operations. As adopted in this final rule, § 229.136(b) requires the outward-facing image recording device to record at a minimum frame rate of 15 fps and have sufficient resolution to record the position of switch points 50 feet in front of the leading locomotive. TCRR questioned the underlying rationale and the benefit of such a requirement on a system that would have a PTC system capable of preventing a trainset from operating through a misaligned switch. Further, TCRR noted that for a trainset operating at 205 mph (330 km/h) the trainset would travel 20 feet between frames using an image recording device with a minimum frame rate of 15 fps and would pass a switch that is located 50 feet in front of the trainset within $\frac{1}{6}$ of a second. TCRR also commented that for its trainsets, the outward-facing image recording device would be mounted at least 12.5 feet back from the front of the trainset, and thus the proposal would effectively require the image recording device to have a resolution capable of detecting the position of switch points 62.5 feet in advance of the switch.

FRA notes that TCRR raises issues that were not fully considered for an exclusive, high-speed passenger rail system. Accordingly, and consistent with FRA's approach to regulating TCRR as a system, FRA is requiring the railroad to develop and define certain image recording system requirements for inclusion in its inspection, testing, and maintenance program. Specifically, § 299.449(b)(4) requires TCRR to define the resolution requirements for outward-facing image recording devices in its inspection, testing, and maintenance program. TCRR must ensure such requirements provide sufficient resolution to determine the position of switch points 50 feet in advance of the trainset (wherever the outward-facing image recording device may be located) while operating at speeds of 170 km/h (106 mph) or below (TCRR track class H4 and below), and to capture images in daylight or with normal nighttime illumination from the trainset's headlight, required by § 299.433. As the resolution requirements adopted under § 229.136(b)(1)(iii) are not specifically attuned to exclusively higher speed passenger rail operations as contemplated by TCRR, FRA has taken into account the conditions under which the outward-facing image recording devices are expected to

operate. FRA notes that, with respect to switches, facing-point diverging moves present an increased risk of derailment, or other accident/incident, compared to other types of moves through a switch, and TCRR's outward-facing image recording devices must therefore be able to capture the position of the switch points. However, FRA is also sensitive to TCRR's concern that at the proposed maximum operating speeds of 330 km/h (205 mph), it may be difficult for an image recording device to capture useful images so close to the leading edge of the trainset. Further, under TCRR's proposed system, facing-point (switch) diverging moves would occur most commonly when entering a station location, at lower speeds. Thus, FRA believes it has harmonized the requirements for outward-facing image recording devices so that they are suitable for TCRR while still capturing images of the more crucial movements along TCRR's right-of-way.

Additionally, § 299.449(c)(1)(i) provides that TCRR will define the resolution requirements for its inward-facing image recording devices in its inspection, testing, and maintenance program, ensuring sufficient resolution to record crewmember actions, including under the lighting conditions specified in § 299.449(c)(1)(iii).

TCRR commented on the periodic inspection and download requirements in proposed paragraph § 229.136(e)(2) to take sample downloads of the image recording system to confirm operation of the system. TCRR agreed with APTA's comment on the part 229 proposal,⁶¹ in which APTA stated that railroads should be allowed to establish their own inspection processes for the image recording system. TCRR stated that such sampling of the image recording system, how often and by whom, should be established under TCRR's inspection, testing, and maintenance program. With respect to TCRR, FRA agrees that such requirements should be developed and defined as part of TCRR's inspection, testing, and maintenance program, consistent with FRA's overall approach to the systems-based use of TCRR's inspection, testing, and maintenance program. Accordingly, § 299.449(e)(2) requires TCRR to define, as part of its inspection, testing, and maintenance program for its rolling stock under § 299.445, the requirements for periodic inspection of and taking sample downloads from its trainset image recording system. FRA also expects that TCRR's training program developed

⁶¹ See Docket No. FRA-2016-0036, Docket ID. FRA-2016-0036-0014 at 5-6.

under 49 CFR part 243 will include appropriate training and qualification requirements for the personnel who will be responsible for inspecting and taking sample downloads from the image recording system.

Finally, § 299.449(i) addresses the removal of an image recording system or device from service and handling for repair. In commenting on proposed § 229.136(i), the part 229 counterpart to this section, TCRR essentially echoed APTA's comments on the proposal.⁶² Specifically, APTA commented that for semi-permanently coupled trainsets, prohibiting the use of the trainset due to a non-functioning image recording device or system could lead to an entire trainset being taken out of service, because individual cars in such trainsets are not typically uncoupled or freely switched; accordingly, if it is not possible to repair or replace the defective image recording device or system by the next calendar day inspection (or, for TCRR, the next pre-service inspection), the proposal could lead to removing an entire trainset from service. TCRR therefore suggested that the regulatory language mirror the statutory language in 49 U.S.C. 20168(j), allowing the image recording device or system to be repaired or replaced "as soon as practicable," rather than by the next pre-service inspection.

Initially, FRA notes that a requirement to repair or replace a defective image recording device or system by the next pre-service inspection would mirror the requirement for event recorders under § 299.439(d). Additionally, FRA is treating the image recording system as a safety device under part 218 and, accordingly, expects that the railroad will make preparations to be able to repair or replace a non-functioning image recording device or system within the timeframe permitted under the regulation. FRA is also treating TCRR trainsets similar to Amtrak's semi-permanently coupled, high-speed trainsets operated exclusively in a designated rail corridor, which are not subject to § 229.136(i)'s exception for long-distance intercity passenger trains.⁶³ Moreover, FRA makes clear that § 299.449 does not prohibit TCRR from using a trainset in revenue service beyond the next pre-service inspection that has only one cab end with a non-

⁶² See Docket No. FRA-2016-0036, Docket ID. FRA-2016-0036-0014.

⁶³ Section 229.136(i) cross-references the definition of long-distance intercity passenger train in § 238.5, which excludes passenger trains operated exclusively on Amtrak's Northeast Corridor regardless of the distance between large cities serviced.

functioning image recording device, provided the system is properly functioning in the cab end that is the leading end of the trainset. Accordingly, § 299.449(i) as adopted in this final rule makes this distinction clear. For clarity, FRA provides two examples to illustrate application of this rule text.

- *Example 1 (Trainset A, with cab ends 1 and 2):* Trainset A is found to have a non-functioning image recording device in cab end 1 (its outward-facing image recording device), and TCRR has it properly taken out service under § 299.449(i)(2). The inward-facing recording device in cab end 1 is still fully functional, along with the event recorder and all image recording devices in cab end 2. After the image recording device in cab end 1 is taken out of service, cab end 1 can remain the leading cab end of the trainset only until the next pre-service inspection required under the railroad’s inspection, testing, and maintenance program, and then the railroad would be required to repair or replace the image recording device before cab end 1 could be used as the leading end for trainset A in revenue service. However, should the railroad elect, the railroad could keep trainset A in service beyond the next pre-service inspection so long as all image recording devices in cab end 2 remained fully functional, along with the event recorder and all other required components. The railroad is limited to using only cab end 2 for trainset A as the leading end for all revenue service movements.

- *Example 2 (Trainset A, with cab ends 1 and 2):* In this example, the trainset’s entire image recording system has been discovered as non-functional (either each cab end has non-functional image recording devices, or some other

failure is affecting the image recording system’s functionally as a whole), and has been properly taken out of service under § 299.449(i)(2). Trainset A can remain in service only until the next pre-service inspection required under the railroad’s inspection, testing, and maintenance program, and then the railroad would be required to repair or replace the image recording system for trainset A before returning it to revenue service.

The distinction between the above examples is that in Example 2, there is no cab end that can serve as the leading end for trainset A while operating in revenue service.

Finally, FRA has added paragraphs (k)(1) and (2) to provide the same employee protections as described under § 217.9(b)(3) and (4). As the rationale for the requirements is the same as discussed under § 217.9(b)(3) and (4), FRA will rely on that discussion without repeating here. FRA’s omission of paragraph (k) in the NPRM to provide these protections expressly was inadvertent, and notes that there are some minor differences between paragraph (k) and § 217.9(b)(3) and (4) only to harmonize the language with that used in part 299 for TCRR.

Appendix A to Part 299—Criteria for Certification of Crashworthy Event Recorder Memory Module

FRA is revising the introductory paragraph of appendix A to part 299 to harmonize the language of the appendix with the introductory paragraph of appendix D to part 229, reflecting the changes made in this final rule.

VI. Regulatory Impact and Notices

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

This final rule was designated as significant by the Office of Information and Regulatory Affairs. The final rule follows the direction of Executive Order 13563, which emphasizes the importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility. However, FRA was unable to determine how effective locomotive image recording devices will be at reducing accidents. Thus, instead of presenting the quantifiable benefits, FRA presents the benefits qualitatively, as discussed further below. Details on the estimated costs of this final rule can be found in the rule’s economic analysis.

This final rule directly responds to the Congressional mandate in section 11411 of the FAST Act that FRA, by delegation from the Secretary, require each railroad that provides intercity rail passenger or commuter rail passenger transportation to install image recording devices on the controlling locomotives of its passenger trains. The requirements of this final rule, as applied to passenger trains, are directly or implicitly required by the Statute and will promote railroad safety.

FRA has prepared and placed an RIA addressing the economic impact of this final rule in the rulemaking docket (Docket no. FRA-2016-0036). The RIA provides estimates of the costs of this final rule that are likely to be incurred over a ten-year period. FRA estimates the low- and high-range costs of this final rule using discount rates of 3 and 7 percent in the tables below.

TABLE 1—TOTAL 10-YEAR COSTS OF LOCOMOTIVE IMAGE RECORDING DEVICES, LOW RANGE
[Costs are in 2018 dollars, in millions]

	Discounted at 7%	Discounted at 3%	Annualized at 7%	Annualized at 3%
Costs	\$42.2	\$46.2	\$6.0	\$5.4
Cost Savings	2.0	2.4	0.3	0.3
Net Costs	40.2	43.9	5.7	5.1

TABLE 2—TOTAL 10-YEAR COSTS OF LOCOMOTIVE IMAGE RECORDING DEVICES, HIGH RANGE
[In millions]

	Discounted at 7%	Discounted at 3%	Annualized at 7%	Annualized at 3%
Costs	\$87.3	\$94.0	\$12.4	\$11.0
Cost Savings	2.0	2.4	0.3	0.3
Net Costs	85.3	91.6	12.1	10.7

As discussed in the preamble above, FRA may consider crashworthiness protection requirements unnecessary (or met) in the future for passenger locomotive image recording device memory modules if recorded data is stored at a remote location away from a locomotive consist, safe from accident destruction. FRA did not require this option because the agency does not believe current technology would reliably allow for such remote transmission and storage in all instances, and such a system would likely be much costlier to develop in order to transfer the recorded data to a centralized location.

In the 2015 Amtrak accident in Philadelphia, Pennsylvania, image recording devices could have helped provide additional causal information during the post-accident investigation. Causal data is especially critical for the prevention of future accidents when no apparent accident cause can be determined through other means. Further, images can become key to

identifying new safety concerns that otherwise would be difficult to research or identify, which could lead FRA and the railroad industry to better understand areas in which safety could be improved. Other safety benefits will also primarily accrue from the deterrence of unsafe behaviors that cause railroad accidents. For instance, the presence of locomotive image recording devices could have deterred the engineer from text messaging while operating the Metrolink train involved in the 2008 accident at Chatsworth, California. In the RIA, FRA discusses and provides examples of how the deterrent effect of locomotive image recording devices could reduce negative behavior because train crews know their actions are being recorded.⁶⁴

The primary source of expected benefits is the potential reduction in safety risk. FRA conducted a literature review to determine the effectiveness rate of inward- and outward-facing recording devices, but was unable to determine an appropriate rate. The

benefits for the final rule are qualitatively discussed. The reduction in safety risk is expected to come primarily from the change in crew behavior. Railroads can deter unsafe behavior if crewmembers realize their actions may be observed on a frequent, but random, basis by railroad supervisors. Locomotive image recorders cannot directly prevent an accident from occurring, but rather can provide investigators with information after an accident occurs that can help to prevent future accidents of that type from occurring.

Although FRA is declining to require locomotive recording devices in freight locomotives, many freight railroads have informed FRA the above reasons are why railroads install camera systems even without an FRA regulation. FRA's analysis shows there are many factors that are difficult to quantify that combine to warrant the final rule.

Tables: Costs of the final rule:

TABLE 3—10-YEAR COSTS AND COST SAVINGS (LOW RANGE)

[In millions]

	Undiscounted	Discounted at 7%	Discounted at 3%	Annualized at 7%	Annualized at 3%
Costs:					
Camera	\$40.6	\$34.6	\$37.7	\$4.9	\$4.4
Crashworthiness	9.2	7.5	8.4	1.1	1.0
Administrative Costs	0.1	0.1	0.1	0.0	0.0
Governmental Costs	0.004	0.004	0.004	0.0006	0.0005
Total Costs	49.9	42.2	46.2	6.0	5.4
Cost Savings:					
Operational Testing	2.7	2.0	2.4	0.3	0.3
Net Costs	47.2	40.2	43.9	5.7	5.1

TABLE 4—10-YEAR COSTS AND COST SAVINGS (HIGH RANGE)

[In millions]

	Undiscounted	Discounted at 7%	Discounted at 3%	Annualized at 7%	Annualized at 3%
Costs:					
Camera	\$90.6	\$79.7	\$85.5	\$11.3	\$10.0
Crashworthiness	9.2	7.5	8.4	1.1	1.0
Administrative Costs	0.1	0.1	0.1	0.0	0.0
Governmental Costs	0.004	0.004	0.004	0.0006	0.0005
Total Costs	99.9	87.3	94.0	12.4	11.0
Cost Savings:					
Operational Testing	2.7	2.0	2.4	0.3	0.3
Net Costs	97.2	85.3	91.6	12.1	10.7

⁶⁴ See Benefits, Section VIII, of the RIA for more information.

B. Regulatory Flexibility Act and Executive Order 13272; Certification

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 *et seq.*) and Executive Order 13272 (67 FR 53461, Aug. 16, 2002) require agency review of proposed and final rules to assess their impacts on small entities. An agency must prepare a Final Regulatory Flexibility Analysis (FRFA) unless it determines and certifies that a rule, if promulgated, would not have a significant economic impact on a substantial number of small entities. As discussed below, FRA does not believe this final rule will have a significant economic impact on a substantial number of small entities.

Under section 312 of the Small Business Regulatory Enforcement Fairness Act of 1996, Public Law 104–121, FRA has issued a final policy statement that formally establishes “small entities” as railroads that meet the line-haulage revenue requirements of a Class III railroad, which is \$20 million or less in inflation-adjusted annual revenues, and commuter

railroads or small governmental jurisdictions that serve populations of 50,000 or less. *See* 49 CFR part 209, app. C.

This final rule will apply to railroad carriers that provide regularly scheduled intercity rail or commuter rail passenger transportation to the public. FRA notes that one passenger railroad is considered a small entity: the Hawkeye Express (operated by the Iowa Northern Railway Company). All other passenger railroad operations in the United States are part of larger governmental entities whose service jurisdictions exceed 50,000 in population, and, based on the definition, are not considered small entities. Hawkeye Express is a short-haul passenger railroad that does not provide commuter or intercity passenger service, and therefore will not be affected by the final rule. Additionally, the Hawkeye Express has not been in operation for at least the past two years. FRA does not believe that the provisions of the final rule will significantly impact a substantial number of small entities.

FRA invited all interested parties to submit comments, data, and information demonstrating the potential economic impact on any small entity that would result from the adoption of the final rule. During the NPRM comment period, FRA did not receive any comments from the public or stakeholders regarding the impact that the final rule would have on small entities.

Accordingly, the FRA Administrator hereby certifies this rule will not have a significant economic impact on a substantial number of small entities.

C. Paperwork Reduction Act

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

CFR section ⁶⁵	Respondent universe	Total annual responses	Average time per responses	Total annual burden hours	Total cost equivalent ⁶⁶
217.7(a)—Operating rules; filing and recordkeeping—Filing of code of operating rules, timetables, and timetable special instructions by Class I, Class II, Amtrak, and commuter railroads with FRA.	2 new railroads	2 documents	1 hour	2	\$154
—(b) Amendments to code of operating rules, timetables, and timetable special instructions by Class I, Class II, Amtrak, and commuter railroads with FRA.	53 railroads	312 revised documents.	20 minutes	104	8,008
—(c) Class III and other railroads—Copy of code of operating rules, timetables, and timetable special instructions at system headquarters.	2 new railroads	2 documents	1 hour	2	154
—(c) Class III and other railroads—Amendments to code of operating rules, timetables, and timetable special instructions at system headquarters.	714 railroads	1,596 amendments	15 minutes	399	30,723
217.9(b)(2)—Program of operational tests and inspections; recordkeeping—Written records documenting qualification of each railroad testing officer.	765 railroads	4,732 records	2 minutes	158	12,166
—(b)(3) Development and adoption of procedure ensuring random selection of employees by railroads utilizing inward-facing locomotive and in-cab audio recordings to conduct operational tests and inspections (New requirement).	36 railroads	12 adopted procedures.	24 hours	288	34,560
—(c) Written program of operational tests and inspections.	2 new railroads	2 programs	10 hours	20	2,400
—(d)(1) Records of operational tests/inspections ..	765 railroads	9,120,000 test records and updates.	5 minutes	760,000	58,520,000
—(d)(2) Railroad copy of current program operational tests/inspections—Amendments.	53 railroads	159 program revisions	70 minutes	186	14,322
—(e)(1)(i) Written quarterly review of operational tests/inspections by RRs other than passenger RRs.	8 (Amtrak + 7 Class I) railroads.	32 reviews	2 hours	64	4,928
—(e)(1)(ii) 6-month review of operational tests/inspections/naming of officer.	7 Class I railroads	14 reviews	2 hours	28	2,156
—(e)(2) 6-month review by passenger railroads designated officers of operational testing and inspection data.	35 (Amtrak + 34 passenger) railroads.	70 reviews	2 hours	140	10,780
—(e)(3) Records of periodic reviews	50 railroads	116 records	1 minute	2	154
—(f)–(g) Annual summary of operational tests and inspections.	50 railroads	71 summary records ..	1 hour	71	5,467
—(h)(1)(i) RR amended program of operational tests/inspections.	765 railroads	6 revised programs	30 minutes	3	231
—(h)(1)(ii) FRA disapproval of RR program of operational tests/inspections and RR written response in support of program.	765 railroads	6 supporting documents.	1 hour	6	462
217.11(a)—RR periodic instruction of employees on operating rules—New railroads.	2 new railroads	2 written programs	8 hours	16	1,232

CFR section ⁶⁵	Respondent universe	Total annual responses	Average time per responses	Total annual burden hours	Total cost equivalent ⁶⁶
217.11(b)—RR copy of amendment of program for periodic instruction of employees.	765 railroads	110 modified written programs.	30 minutes	55	4,235
218.95(a)(5)—(b)—Instruction, training, examination—Employee records.	765 railroads	85,600 employees' records.	1 minute	1,427	109,879
—(c)(1)(i) Amended RR program of instruction, testing, examination.	765 railroads	5 amended programs	30 minutes	3	231
218.97(b)(4)—RR copy of good faith challenge procedures.	765 railroads	4,732 copies to new employees.	6 minutes	473	36,421
218.97(c)(1) and (c)(4)—RR employee good faith challenge of RR directive.	10 workers	10 gd. faith challenges	15 minutes	3	231
—(c)(5) RR resolution of employee good faith challenge.	2 new railroads	5 responses	15 minutes	1	77
—(d)(1) RR officer immediate review of unresolved good faith challenge.	2 new railroads	3 reviews	30 minutes	2	154
—(d)(2) RR officer explanation to employee that Federal law may protect against employer retaliation for refusal to carry out work if employee refusal is a lawful, good faith act.	2 new railroads	3 answers	15 minutes	1	77
—(d)(3) Employee written/electronic protest of employer final decision.	2 new railroads	3 written protests	15 minutes	1	77
—(d)(3) Employee copy of protest	2 new railroads	3 copies	1 minute	0.1	8
—(d)(4) Employer further review of good faith challenge after employee written request.	2 new railroads	2 further reviews	15 minutes	0.5	39
—(d)(4) RR verification decision to employee in writing.	2 new railroads	2 decisions	15 minutes	0.5	39
—(e) Recordkeeping and record retention—Employer's copy of written procedures at division headquarters.	765 railroads	765 copies	5 minutes	64	4,928
218.99(a)—Shoving or pushing movement—RR operating rule complying with section's requirements.	2 new railroads	2 rule modifications	1 hour	2	154
218.101(a)—(c)—Leaving equipment in the clear—Operating rule that complies with this section.	2 new railroads	2 rule modifications	30 minutes	1	77
218.103(a)(1)—Hand-Operated Switches—Operating Rule that Complies with this section.	2 new railroads	2 rule modifications	30 minutes	1	77
229.22—Locomotive image recording systems—Form FRA F 6180-49AP (New requirements) ⁶⁷ .	36 railroads	4,500 passenger locomotives.	15 minutes	1,125	86,625
229.136(f)(1)—Passenger railroads adoption and development of chain of custody (c of c) procedures (New requirements).	36 railroads	12 c of c procedures ..	48 hours	576	44,352
—(f)(2)—(3) Passenger railroad preservation of accident/incident data of image and audio recording system from locomotive using such system at time of accident/incident (includes voluntary freight railroads & restates previous requirement under section 229.135(e)) (New requirements).	36 railroads	140 saved recordings	10 minutes	23	1,771
—(g) Locomotive image recording system approval process—Description of technical aspects any locomotive image recording system to FRA for approval (New requirements).	36 railroads	12 descriptions/plans ..	20 hours	240	18,480
Total	765 railroads	9,223,047 responses ..	N/A	765,488	58,955,829

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

For information or a copy of the paperwork package submitted to OMB, contact Ms. Arlette Mussington, Information Collection Clearance Officer, at email: Arlette.Mussington@dot.gov or telephone: (571) 609-1285 or Ms. Joanne Swafford, Information

⁶⁵ FRA anticipates that no procedures will be disapproved under § 217.9(b)(4). Additionally, the burdens associated under § 299.449 and appendix A to part 299 have been accounted for under the burden associated with § 229.136(f) and (g).

⁶⁶ The dollar equivalent cost is derived from the 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.

⁶⁷ The burdens for §§ 229.21, 229.136(a)(3), (e)(2), and 229.139(i) are covered under § 229.22.

Collection Clearance Officer, at email: Joanne.Swafford@dot.gov or telephone: (757) 897-9908.

Organizations and individuals desiring to submit comments on the collection of information requirements should direct them to Ms. Arlette Mussington, Information Collection Clearance Officer, at email: Arlette.Mussington@dot.gov or telephone: (571) 609-1285 or Ms. Joanne Swafford, Information Collection Clearance Officer, at email: Joanne.Swafford@dot.gov or telephone: (757) 897-9908.

OMB must make a decision 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 received two public comments on the information collection requirements contained in the NPRM.

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. The current OMB control number for this rule is 2130-0035.

D. Federalism Implications

Executive Order 13132, "Federalism" (64 FR 43255, Aug. 10, 1999), requires FRA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" are defined in the Executive Order to include regulations that have "substantial direct effects on the States,

on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.” Under Executive Order 13132, the agency may not issue a regulation with federalism implications that imposes substantial direct compliance costs and that is not required by statute, unless the Federal Government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or the agency consults with State and local government officials early in the process of developing the regulation. Where a regulation has federalism implications and preempts State law, the agency seeks to consult with State and local officials in the process of developing the regulation.

FRA has analyzed this final rule under the principles and criteria contained in Executive Order 13132. This final rule could affect State and local governments to the extent that they sponsor, or exercise oversight of, passenger railroads. Because this final rule is required by Federal statute for passenger railroads under 49 U.S.C. 20168, the consultation and funding requirements of Executive Order 13132 do not apply. However, this final rule could have preemptive effect by operation of law under certain provisions of the Federal railroad safety statutes, specifically the former Locomotive Inspection Act and the former Federal Railroad Safety Act of 1970, repealed and recodified at 49 U.S.C. 20701 *et seq.* and 49 U.S.C. 20106, respectively. Section 20701 governs all “parts and appurtenances” of locomotives, and has been held to occupy the field.⁶⁸ Section 20106 provides that States may not adopt or continue in effect any law, regulation, or order related to railroad safety or security that covers the subject matter of a regulation prescribed or order issued by the Secretary of Transportation (with respect to railroad safety matters) or the Secretary of Homeland Security (with respect to railroad security matters), except when the State law, regulation, or order qualifies under the “essentially local safety or security hazard” exception to section 20106.

In sum, FRA has analyzed this final rule under the principles and criteria in Executive Order 13132. As explained above, FRA has determined this final rule has no federalism implications, other than the possible preemption of State laws under Federal railroad safety

statutes, specifically 49 U.S.C. 20701 *et seq.* and 49 U.S.C. 20106. Therefore, preparation of a federalism summary impact statement for this final rule is not required.

E. Environmental Impact

Consistent with the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality’s NEPA implementing regulations at 40 CFR parts 1500 through 1508, and FRA’s NEPA implementing regulations at 23 CFR part 771, FRA has evaluated this final rule 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.⁶⁹ Specifically, FRA has determined that this final rule is categorically excluded from detailed environmental review pursuant to 23 CFR 771.116(c)(15), “[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.”

The purpose of this rulemaking is to require commuter and intercity passenger railroads to install recording devices on locomotives in compliance with this rule and use those devices to help investigate and prevent railroad accidents. This rule does not directly or indirectly impact any environmental resources and will 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.⁷⁰ FRA has concluded that no such unusual circumstances exist with respect to this final rule and it meets the requirements for categorical exclusion under 23 CFR 771.116(c)(15).

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.⁷¹ FRA has also determined that this rulemaking will not approve a project

resulting in a use of a resource protected by Section 4(f).⁷² Further, FRA reviewed this final rule and found it consistent with Executive Order 14008, Tackling the Climate Crisis at Home and Abroad.

F. Executive Order 12898 (Environmental Justice)

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and DOT Order 5610.2C (require DOT agencies to achieve environmental justice as part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including interrelated social and economic effects, of their programs, policies, and activities on minority populations and low-income populations. The DOT Order instructs DOT agencies to address compliance with Executive Order 12898 and requirements within the DOT Order in rulemaking activities, as appropriate. FRA has evaluated this final rule under Executive Order 12898 and the DOT Order and has determined it will not cause disproportionately high and adverse human health and environmental effects on minority populations or low-income populations.

G. Executive Order 13175 (Tribal Consultation)

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

H. Unfunded Mandates Reform Act of 1995

Under Section 201 of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4, 2 U.S.C. 1531), each Federal agency “shall, unless otherwise prohibited by law, assess the effects of Federal regulatory actions on State, local, and tribal governments, and the private sector (other than to the extent that such regulations incorporate requirements specifically set forth in

⁶⁸ See, e.g., *Napier v. Atlantic Coastline RR. Co.*, 272 U.S. 605 (1926).

⁶⁹ See 40 CFR 1508.4.

⁷⁰ See 23 CFR 771.116(b).

⁷¹ See 54 U.S.C. 306108.

⁷² See Department of Transportation Act of 1966, as amended (Pub. L. 89–670, 80 Stat. 931); 49 U.S.C. 303.

law).” Section 202 of the Unfunded Mandates Reform Act (2 U.S.C. 1532) further requires that before promulgating any general notice of proposed rulemaking that is likely to result in the promulgation of any rule that includes any Federal mandate that may result in expenditure by State, local, and Tribal Governments, in the aggregate, or by the private sector, of \$100,000,000 or more (adjusted annually for inflation) in any 1 year, and before promulgating any final rule for which a general notice of proposed rulemaking was published, the agency shall prepare a written statement detailing the effect on State, local, and Tribal Governments and the private sector. This final rule will 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 requires Federal agencies to prepare a Statement of Energy Effects for any “significant energy action.”⁷³ FRA evaluated this final rule in accordance with Executive Order 13211 and determined that this regulatory action is not a “significant energy action” within the meaning of the Executive order.

J. Trade Impact

The Trade Agreements Act of 1979 (Pub. L. 96–39, 19 U.S.C. 2501 *et seq.*) prohibits Federal agencies from engaging in any standards setting or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. FRA has assessed the potential effect of this final rule on foreign commerce and believes that its requirements are consistent with the Trade Agreements Act of 1979. The requirements are safety standards, which, as noted, are not considered unnecessary obstacles to trade.

K. Congressional Review Act

Pursuant to the Congressional Review Act (5 U.S.C. 801 *et seq.*), the Office of Information and Regulatory Affairs did not designate this rule as a “major rule” as defined by 5 U.S.C. 804(2).

List of Subjects

49 CFR Part 217

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

49 CFR Part 218

Locomotives, Occupational safety and health, Penalties, Railroad employees, Railroad safety, and Tampering.

49 CFR Part 229

Locomotives, Penalties, Railroad employees, Railroad safety, Reporting and recordkeeping requirements.

49 CFR Part 299

High-speed rail, Railroad safety, Reporting and recording requirements, Tokaido Shinkansen.

The Final Rule

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

PART 217—RAILROAD OPERATING RULES

The authority citation for part 217 is revised to read as follows:

- 1. Authority: 49 U.S.C. 20103, 20107, 20168, 28 U.S.C. 2461, note; and 49 CFR 1.89.

Subpart A—General

- 2. In § 217.9, add paragraphs (b)(3) and (4) to read as follows:

§ 217.9 Program of operational tests and inspections; recordkeeping.

* * * * *

(b) * * *

(3) A passenger railroad that utilizes inward-facing locomotive image or in-cab audio recordings to conduct operational tests and inspections shall adopt and comply with a procedure in its operational tests and inspections program that ensures employees are randomly subject to such operational tests and inspections involving image or audio recordings. The procedure adopted by a passenger railroad must:

- (i) Establish objective, neutral criteria to ensure every employee subject to such operational tests and inspections is selected randomly for such operational tests and inspections within a specified time frame;
- (ii) Not permit subjective factors to play a role in selection, *i.e.*, no employee may be selected based on the exercise of a railroad’s discretion; and
- (iii) Require that any operational test or inspection using locomotive image or

audio recordings be performed within 72 hours of the completion of the employee’s tour of duty that is the subject of the operational test. Any operational test performed more than 72 hours after the completion of the tour of duty that is the subject of the test is a violation of this section. The 72-hour limitation does not apply to investigations of railroad accidents/incidents or to violations of Federal railroad safety laws, regulations, or orders, or any criminal laws.

(4) FRA may review a passenger railroad’s procedure implementing paragraph (b)(3) of this section, and, for cause stated, may disapprove such procedure under paragraph (h) of this section.

* * * * *

PART 218—RAILROAD OPERATING PRACTICES

- 3. The authority citation for part 218 continues to read as follows:

Authority: 49 U.S.C. 20103, 20107, 20131, 20138, 20144, 20168; 28 U.S.C. 2461 note; and 49 CFR 1.89.

Subpart D—Prohibition Against Tampering With Safety Devices

- 4. In § 218.53, revise paragraph (c) and add paragraph (d) to read as follows:

§ 218.53 Scope and definitions.

* * * * *

(c) *Safety Device* means any locomotive-mounted equipment used either to assure the locomotive engineer is alert, not physically incapacitated, and aware of and complying with the indications of a signal system or other operational control system, or a system used to record data concerning the operations of that locomotive or the train it is powering. See appendix C to this part for a statement of agency policy on this subject.

(d) The provisions in §§ 218.59 and 218.61 do not apply to locomotive-mounted image or audio recording equipment on freight locomotives.

- 5. Revise § 218.61(c) to read as follows:

§ 218.61 Authority to deactivate safety devices.

* * * * *

(c) If a locomotive in commuter or intercity passenger service is equipped with a device to record data concerning the operation of that locomotive or the train it is powering, that device may be deactivated only under the provisions of § 229.135 of this chapter. Inward- and outward-facing image recording devices on commuter or intercity passenger

⁷³ 66 FR 28355 (May 22, 2001).

locomotives may be deactivated only under the provisions of § 229.136 of this chapter. This section does not apply to inward- or outward-facing image recording devices that are installed on freight locomotives.

■ 6. In appendix C to part 218, revise the fifth sentence of the fourth paragraph of appendix C to part 218 to read as follows:

Appendix C—Statement of Agency Enforcement Policy on Tampering

* * * * *

Safety Devices Covered by This Rule

* * * This regulation applies to a variety of devices including equipment known as “event recorders,” “alerters,” “deadman controls,” “automatic cab signal,” “cab signal whistles,” “automatic train stop equipment,” “automatic train control equipment,” “positive train control equipment,” and “passenger locomotive-mounted image and audio recording equipment.” * * *

* * * * *

PART 229—RAILROAD LOCOMOTIVE SAFETY STANDARDS

■ 7. The authority citation for part 229 is revised to read as follows:

Authority: 49 U.S.C. 20103, 20107, 20133, 20137–38, 20143, 20168, 20701–03, 21301–02, 21304, 28 U.S.C. 2461, note; and 49 CFR 1.89.

Subpart A—General

■ 8. In § 229.5, revise the definition of “Event recorder memory module” and add, in alphabetical order, definitions of “Image recording system” and “Recording device” to read as follows:

§ 229.5 Definitions.

* * * * *

Event recorder memory module means that portion of an event recorder used to retain the recorded data as described in §§ 229.135(b) and 229.136(a) through (c).

* * * * *

Image recording system means a system of cameras or other electronic devices that record images as described in § 229.136, and any components that convert those images into electronic data transmitted to, and stored on, a memory module.

* * * * *

Recording device means a device that records images or audible sounds, as described in § 229.136.

* * * * *

Subpart B—Inspections and Tests

■ 9. In § 229.21, revise paragraphs (a) and (b) to read as follows:

§ 229.21 Daily inspection.

(a) Except for MU locomotives, each locomotive in use shall be inspected at least once during each calendar day. A written report of the inspection shall be made. This report shall contain the name of the carrier; the initials and number of the locomotive; the place, date and time of the inspection; a description of the non-complying conditions disclosed by the inspection; and the signature of the employee making the inspection. Except as provided in §§ 229.9, 229.136, 229.137, and 229.139, any conditions that constitute non-compliance with any requirement of this part shall be repaired before the locomotive is used. Except with respect to conditions that do not comply with §§ 229.136, 229.137, or 229.139, a notation shall be made on the report indicating the nature of the repairs that have been made. Repairs made for conditions that do not comply with §§ 229.136, 229.137, or 229.139 may be noted on the report, or in electronic form. The person making the repairs shall sign the report. The report shall be filed and retained for at least 92 days in the office of the carrier at the terminal at which the locomotive is cared for. A record shall be maintained on each locomotive showing the place, date and time of the previous inspection.

(b) Each MU locomotive in use shall be inspected at least once during each calendar day and a written report of the inspection shall be made. This report may be part of a single master report covering an entire group of MU locomotives. If any non-complying conditions are found, a separate, individual report shall be made containing the name of the carrier; the initials and number of the locomotive; the place, date, and time of the inspection; the non-complying conditions found; and the signature of the inspector. Except as provided in §§ 229.9, 229.136, 229.137, and 229.139, any conditions that constitute non-compliance with any requirement of this part shall be repaired before the locomotive is used. Except with respect to conditions that do not comply with §§ 229.136, 229.137, or 229.139, a notation shall be made on the report indicating the nature of the repairs that have been made. Repairs made for conditions that do not comply with §§ 229.136, 229.137, or 229.139 may be noted on the report, or in electronic form. A notation shall be made on the report indicating the nature of the repairs that have been made. The person making the repairs shall sign the report. The report shall be filed in the office of

the carrier at the place where the inspection is made or at one central location and retained for at least 92 days.

* * * * *

■ 10. Add § 229.22 to read as follows:

§ 229.22 Passenger locomotive inspection and repair record.

(a) *Application.* This section applies only to lead locomotives of trains used in commuter or intercity passenger service, *i.e.*, locomotives subject to the requirements of § 229.136.

(b) *Dates.* (1) Each locomotive subject to the requirements of § 229.136 shall use and maintain Form FRA F 6180–49AP in accordance with the requirements of § 229.136, except that Form FRA F 6180–49A may fulfill any requirement in § 229.136 with respect to Form FRA F 6180–49AP until October 12, 2027.

(2) For purposes of complying with the inspection, testing, and repair recordkeeping requirements in §§ 229.23, 229.27, 229.29, 229.31, 229.33, 229.55, 229.103, 229.105, 229.114, 229.123, and 229.135 with respect to Form FRA F 6180–49A, each locomotive subject to the requirements of § 229.136 shall instead use and maintain Form FRA F 6180–49AP no later than October 12, 2027.

(c) *Earlier adoption.* Railroads may adopt use of Form FRA F 6180–49AP earlier than required for locomotives subject to the requirements of § 229.136.

(d) *Effect.* Nothing in this section affects the requirements in this part for use of Form FRA F 6180–49A for locomotives not subject to the requirements of § 229.136.

Subpart C—Safety Requirements

■ 11. Add § 229.136 to read as follows:

§ 229.136 Locomotive image and audio recording devices.

(a) *Duty to equip and record.* (1) Effective October 12, 2027, each lead locomotive of a train used in commuter or intercity passenger service must be equipped with an image recording system to record images of activities ahead of the locomotive in the direction of travel (outward-facing image recording device), and of activities inside the cab of the locomotive (inward-facing image recording device).

(i) If the lead locomotive is equipped with an image recording system, the system must be turned on and recording whenever a train is in motion, at all train speeds.

(ii) If operating circumstances cause the controlling locomotive to be other than the lead locomotive, railroads must

also record images of activities inside the cab of the controlling locomotive.

(iii) Both cabs of a dual-cab locomotive shall be equipped with inward- and outward-facing image recording systems. Image recordings for only a dual-cab locomotive's active cab and the leading end of the locomotive's movement are required to be made and retained.

(2) Image recording systems installed after October 12, 2024, on new, remanufactured, or existing lead locomotives used in commuter or intercity passenger service shall meet the requirements of this section. Lead locomotives used in commuter or intercity passenger service must be equipped with an image recording system meeting the requirements of this section no later than October 12, 2027.

(3) For lead locomotives in commuter or intercity passenger service, railroads must note the presence of any image or audio recording systems in the REMARKS section of Form FRA F 6180-49AP in the locomotive cab.

(4) As required under paragraph (a)(1) or (2) of this section, the image recording system shall record at least the most recent 12 hours of operation of a lead locomotive in commuter or intercity passenger service.

(5) Locomotive recording device data for each lead locomotive used in commuter or intercity passenger service shall be recorded on a memory module meeting the requirements for a certified crashworthy event recorder memory module described in appendix D to this part, or on an alternative, remote storage system that provides at least equivalent data protections and is approved by FRA under paragraph (g) of this section.

(i) Paragraph (a)(5) of this section applies to locomotive image recording systems as required under paragraph (a)(1) or (2) of this section.

(ii) Audio recording systems installed after October 12, 2024, on new, remanufactured, or existing lead locomotives used in commuter or intercity passenger service shall meet the requirements of paragraph (a)(5) of this section. Audio recording systems installed on lead locomotives in commuter or intercity passenger service must meet the requirements of paragraph (a)(5) of this section no later than October 12, 2027.

(b) *Outward-facing recording system requirements for lead locomotives in commuter or intercity passenger service.*

(1) As required under paragraph (a)(1) or (2) of this section, the image recording system shall:

(i) Include an image recording device aimed parallel to the centerline of

tangent track within the gauge on the front end of the locomotive;

(ii) Be able to distinguish the signal aspects displayed by wayside signals;

(iii) Record at a minimum frame rate of 15 frames per second (or its equivalent) and have sufficient resolution to record the position of switch points 50 feet in front of the locomotive;

(iv) Be able to capture images in daylight or with normal nighttime illumination from the headlight of the locomotive; and

(v) Include an accurate time and date stamp on image recordings.

(2) If a lead locomotive in commuter or intercity passenger service experiences a technical failure of its outward-facing image recording system, then the system shall be removed from service and handled in accordance with paragraph (i) of this section.

(c) *Inward-facing image recording system requirements for lead locomotives in commuter or intercity passenger service.* (1) As required under paragraph (a)(1) or (2) of this section, the image recording system shall include an image recording device positioned to provide complete coverage of all areas of the controlling locomotive cab where a crewmember typically may be positioned, including complete coverage of the instruments and controls required to operate the controlling locomotive in normal use, and:

(i) Have sufficient resolution to record crewmember actions;

(ii) Record at a minimum frame rate of 5 frames per second;

(iii) Be capable of using ambient light in the cab, and when ambient light levels drop too low for normal operation, automatically switch to infrared or another operating mode that enables the recording sufficient clarity to comply with the requirements of this paragraph (c)(1); and

(iv) Include an accurate time and date stamp on image recordings.

(2) No image recordings may be made of any activities within a locomotive's sanitation compartment as defined in § 229.5, and no image recording device shall be installed in a location where the device can record activities within a sanitation compartment.

(3) If a lead locomotive in commuter or intercity passenger service experiences a technical failure of its inward-facing image recording system, the system shall be removed from service and handled in accordance with paragraph (i) of this section.

(d) *Image and audio recording system protection requirements for lead locomotives in commuter or intercity passenger service.* Railroads must

provide convenient wired or wireless connections to allow authorized railroad personnel to download audio or image recordings from any certified crashworthy event recorder memory module in a lead locomotive in commuter or intercity passenger service. The railroads must use electronic security measures, and apply appropriate cybersecurity measures, to prevent unauthorized access to, and download, deletion, or alteration of, the recording system or its recordings.

(1) Paragraph (d) of this section applies to locomotive image recording systems as required under paragraph (a)(1) or (2) of this section.

(2) Audio recording systems installed after October 12, 2024, on new, remanufactured, or existing lead locomotives used in commuter or intercity passenger service shall meet the requirements of paragraph (d) of this section. Audio recording devices installed on lead locomotives in commuter or intercity passenger service must meet the requirements of paragraph (d) of this section no later than October 12, 2027.

(e) *Inspection, testing, and maintenance for image recording systems on lead locomotives in commuter or intercity passenger service.* As required under paragraph (a)(1) or (2) of this section, the image recording system shall have self-monitoring features to assess whether the system is operating properly, including whether the system is powered on.

(1) If a fault with the image recording system is detected, the locomotive may be used in the lead position only in accordance with paragraph (i) of this section.

(2) As required under paragraph (a)(1) or (2) of this section, at each annual test required under § 229.27, the railroad conducting the inspection shall take sample download(s) from the image recording system's crashworthy event recorder memory module, or an FRA-approved equivalent under paragraph (g) of this section, to confirm proper operation of the system, and, if necessary, repair the system to full operation.

(f) *Handling of recordings—(1) Chain-of-custody procedure.* Each railroad with locomotives in commuter or intercity passenger service subject to this section shall adopt, maintain, and comply with a chain-of-custody procedure governing the handling and the release of the locomotive image recordings described in paragraphs (a) through (c) of this section and any locomotive audio recordings. The chain-of-custody procedure must specifically address the preservation and handling

requirements for post-accident/incident recordings provided to FRA or other Federal agencies under paragraph (f)(2) of this section.

(2) *Accident/incident preservation.* If any locomotive in commuter or intercity passenger service equipped with an image or audio recording system is involved in an accident/incident that must be reported to FRA under part 225 of this chapter, the railroad that was using the locomotive at the time of the accident shall, to the extent possible, and to the extent consistent with the safety of life and property, preserve the data recorded by each such device for analysis by FRA or other Federal agencies. A railroad must either provide the image and/or audio data in a format readable by FRA or other Federal agencies; or make available to FRA or other Federal agencies any platform, software, media device, etc., that is required to play back the image and/or audio data. This preservation requirement shall expire one (1) year after the date of the accident, unless FRA or another Federal agency notifies the railroad in writing that it must preserve the recording longer. Railroads may extract and analyze such data for the purposes described in paragraph (f)(3) of this section, only if:

(i) The original downloaded data file, or an unanalyzed exact copy of it, is retained in secure custody under the railroad's procedure adopted under paragraph (f)(1) of this section; and
(ii) The original downloaded data file, or an unanalyzed exact copy of it, is not utilized for any other purpose, except by direction of FRA or another Federal agency.

(3) *Recording uses.* A railroad may use the image and audio recordings from a locomotive in commuter or intercity passenger service subject to this section to:

- (i) Investigate an accident/incident that is required to be reported to FRA under part 225 of this chapter;
- (ii) Investigate a violation of a Federal railroad safety law, regulation, or order, or a railroad's operating rules and procedures;
- (iii) Conduct an operational test under § 217.9 of this chapter;
- (iv) Monitor for unauthorized occupancy of a locomotive's cab or a control cab locomotive's operating compartment;
- (v) Investigate a violation of a criminal law;
- (vi) Assist Federal agencies in the investigation of a suspected or confirmed act of terrorism; or
- (vii) Perform inspection, testing, maintenance, or repair activities to ensure the proper installation and

functioning of an image or audio recorder.

(g) *Locomotive image recording system approval process.* Each railroad with locomotives in commuter or intercity passenger service subject to this section must provide the FRA Associate Administrator for Railroad Safety and Chief Safety Officer with a description of the technical aspects of any locomotive image recording system installed to comply with this section. The required description must be submitted via electronic mail to the following email address: *FRARRSMPE@dot.gov*.

(1) The description must include information specifically addressing the image recording system's:

- (i) Minimum 12-hour continuous recording capability;
- (ii) Crashworthiness; and
- (iii) Post-accident accessibility of the system's recordings.

(2) The railroad must submit the statement not less than 90 days before the installation of such image recording system, or, for existing systems, not more than 60 days after November 13, 2023.

(3) The FRA Associate Administrator for Railroad Safety and Chief Safety Officer will review a railroad's submission and must approve any locomotive image recording system intended to comply with this section before the system can be installed or put into service. FRA may disapprove any locomotive image recording systems that do not meet the requirements of this section.

(h) *Relationship to other laws.* Nothing in this section is intended to alter the legal authority of law enforcement officials investigating potential violation(s) of State criminal law(s), and nothing in this section is intended to alter in any way the priority of investigations under 49 U.S.C. 1131 and 1134, or the authority of the Secretary of Transportation to investigate railroad accidents under 49 U.S.C. 5121, 5122, 20107, 20111, 20112, 20505, 20702, 20703, and 20902.

(i) *Removal of device from service and handling for repair.* A railroad may remove from service an image recording device on a locomotive in commuter or intercity passenger service, and must remove the device from service if the railroad knows the device is not properly recording. When a railroad removes a locomotive image recording device from service, a qualified person shall record the date the device was removed from service on Form FRA F 6180-49AP, under the REMARKS section. Except as provided in this paragraph, a locomotive on which an

image recording device has been taken out of service as provided in this paragraph may remain as the lead locomotive only until the next calendar-day inspection required under § 229.21. A locomotive with an inoperative image recording device alone is not deemed to be in an improper condition, unsafe to operate, or a non-complying locomotive under §§ 229.7 and 229.9. A locomotive in a long-distance intercity passenger train, as defined in § 238.5 of this chapter, with a non-operational image recording device may remain as the lead locomotive until arrival at its destination terminal or its nearest forward point of repair, whichever occurs first.

(j) *Disabling or interfering with locomotive-mounted audio and video recording equipment.* Any individual who willfully disables or interferes with the intended functioning of locomotive-mounted image or audio recording system equipment on a passenger locomotive, or who tampers with or alters the data recorded by such equipment, is subject to a civil penalty and to disqualification from performing safety-sensitive functions on a railroad as provided in parts 209 and 218 of this chapter.

(k) *As used in this section—Train* means (1) A single locomotive;

(2) Multiple locomotives coupled together; or

(3) One or more locomotives coupled with one or more cars.

(l) *Freight rescue locomotives.* The requirements of this section do not apply to a freight locomotive when used to haul a passenger train due to the failure of a passenger locomotive.

■ 12. Revise the introductory paragraph of appendix D to part 229 to read as follows:

Appendix D to Part 229—Criteria for Certification of Crashworthy Event Recorder Memory Module

Section 229.135(b) requires railroads to equip certain locomotives with an event recorder that includes a certified crashworthy event recorder memory module. Section 229.136(a)(1) requires passenger railroads to install locomotive-mounted image recording systems in every lead locomotive used in commuter or intercity passenger service. As required by § 229.136(a)(5), data from these image and voluntarily installed audio recording systems must be recorded on a certified crashworthy memory module or on an alternative, remote storage system that provides at least equivalent data protections and is approved by FRA under § 229.136(g). This appendix prescribes the requirements for certifying an event recorder memory module (ERMM) or a locomotive-mounted audio and/or image recording device memory module as crashworthy. For purposes of this

appendix, a locomotive-mounted audio or image recording device memory module is also considered an ERMM. This appendix includes the performance criteria and test sequence for establishing the crashworthiness of the ERMM and marking the event recorder or locomotive-mounted image or audio recording system containing the crashworthy ERMM.

* * * * *

PART 299—TEXAS CENTRAL RAILROAD HIGH-SPEED RAIL SAFETY STANDARDS

■ 13. The authority citation for part 299 continues to read as follows:

Authority: 49 U.S.C. 20103, 20107, 20133, 20141, 20302–20303, 20306, 20701–20702, 21301–21302, 21304; 28 U.S.C. 2461, note; and 49 CFR 1.89.

■ 14. In § 299.5, add definitions for the terms “Event recorder memory module,” “Image recording system”, and “Image recording device” to read as follows:

§ 299.5 Definitions.

* * * * *

Event recorder memory module means that portion of an event recorder used to retain the recorded data as described in §§ 299.439(c) and 299.449(a) through (c).

* * * * *

Image recording device means a device that records images, as described in § 299.449.

Image recording system means a system of electronic devices capable of recording images as described in § 299.449, and any components that convert those images into electronic data transmitted to, and stored on, a certified crashworthy memory module as described in appendix A to this part.

* * * * *

■ 15. Add § 299.449 to read as follows:

§ 299.449 Trainset image and audio recording system.

(a) *Duty to equip and record.* (1) Each trainset used in revenue service must be equipped with an image recording system comprised of—

(i) Outward-facing image recording devices capable of recording images of the right-of-way ahead of the trainset in the direction of travel as further described in paragraph (b) of this section; and,

(ii) Inward-facing image recording devices capable of recording images of crewmember activities inside the leading trainset cab as further described in paragraph (c) of this section.

(2) The image recording system must be turned on and recording whenever a trainset is in motion, at all speeds. If

operating circumstances cause the controlling cab to be other than the cab of the leading end of the trainset, the railroad must also record images of activities inside the controlling cab.

(3) The trainset image recording system shall record at a minimum the most recent 12 hours of operation of a leading trainset cab used in revenue service.

(4) Image recording device data for each leading trainset cab used in revenue service shall be recorded on a memory module meeting the requirements for a certified crashworthy event recorder memory module described in appendix A to this part or on an alternative, remote storage system that provides at least equivalent data protections and is approved by FRA under paragraph (g) of this section.

(b) *Outward-facing recording device requirements for leading trainset cabs used in revenue service.* The image recording system shall—

(1) Include an image recording device aimed parallel to the centerline of tangent track within the gauge on the leading end of the trainset;

(2) Be able to distinguish the signal aspects displayed by go/no-go signals;

(3) Record at a minimum frame rate of 15 frames per second (or its equivalent);

(4) Have sufficient resolution, as defined by the railroad in the railroad’s inspection, testing, and maintenance program under § 299.445, to record the position of switch points in advance of the trainset at speeds of 170 km/h (106 mph) and below, and to capture images in daylight or with normal nighttime illumination from the headlight of the trainset; and

(5) Include an accurate time and date stamp on image recordings.

(c) *Inward-facing image recording device requirements for leading trainset cabs used in revenue service.* (1) The image recording system shall include an image recording device positioned to provide complete coverage of all areas of the leading trainset cab where a crewmember typically may be positioned, including complete coverage of the instruments and controls required to operate the trainset in normal use, and—

(i) Have sufficient resolution, as defined in the railroad’s inspection, testing, and maintenance program under § 299.445, to record crewmember actions;

(ii) Record at a minimum frame rate of 5 frames per second;

(iii) Be capable of using ambient light in the cab, and when ambient light levels drop too low for normal operation, automatically switch to infrared or another operating mode that

enables the recording sufficient clarity to comply with the requirements of this paragraph (c)(1); and

(iv) Include an accurate time and date stamp on image recordings.

(2) Inward-facing image recording devices shall not be installed in a location where the device can record activities within a trainset cab’s sanitation compartment, as defined in § 229.5 of this chapter, and shall not be used to make recordings of any activities within a trainset cab’s sanitation compartment.

(3) If a leading trainset cab used in revenue service experiences a technical failure of its inward-facing image recording system, then the system shall be removed from service and handled in accordance with paragraph (i) of this section.

(d) *Image recording system protection requirements for leading trainset cabs used in revenue service.* The railroad must provide convenient wired or wireless connections to allow authorized railroad personnel to download audio or image recordings from any certified crashworthy event recorder memory module in leading trainset cabs used in revenue service. The railroad also must use electronic security measure(s), and apply appropriate cybersecurity measures, to prevent unauthorized access to, and download, deletion, or alteration of, the recording system or its recordings.

(e) *Inspection, testing, and maintenance for image recording systems in leading trainset cabs used in revenue service.* (1) The image recording system in trainsets used in revenue service shall have self-monitoring features to assess whether the system is operating properly, including whether the system is powered on.

(2) Periodic inspection requirements for the trainset image recording system shall be defined in the railroad’s inspection, testing, and maintenance program required under § 299.445. As part of the periodic inspection, the railroad shall take sample download(s) from the image recording system’s crashworthy memory module to confirm proper operation of the system, and, if necessary, repair the system to full operation.

(f) *Handling of recordings.* (1) *Chain-of-custody procedure.* The railroad shall develop, adopt, maintain, and comply with a chain-of-custody procedure governing the handling and the release of the image recordings described in paragraphs (a) through (c) of this section and any audio recordings. The chain-of-custody procedure must specifically address the preservation and handling requirements for post-accident/incident

recordings provided to FRA or other Federal agencies under paragraph (f)(2) of this section.

(2) *Accident/incident preservation.* If any trainset equipped with an image or audio recording system is involved in an accident/incident that must be reported to FRA under part 225 of this chapter, the railroad shall, to the extent possible, and to the extent consistent with the safety of life and property, preserve the data recorded by the system for analysis by FRA or other Federal agencies. The railroad must either provide the image and/or audio data in a format readable by FRA or other Federal agencies; or make available to FRA or other Federal agencies any platform, software, media device, etc., that is required to play back the image and/or audio data. This preservation requirement shall expire one year after the date of the accident unless FRA or another Federal agency notifies the railroad in writing that it must preserve the recording longer. The railroad may extract and analyze such data for the purposes described in paragraph (f)(3) of this section, only if—

- (i) The original downloaded data file, or an unanalyzed exact copy of it, is retained in secure custody under the railroad's procedure adopted under paragraph (f)(1) of this section; and
 - (ii) It is not utilized for analysis or any other purpose, except by direction of FRA or another Federal agency.
- (3) *Recording uses.* Subject to the conditions specified in paragraph (f)(2) of this section, the railroad may use image and audio recordings from a leading trainset cab used in revenue service subject to this section to—
- (i) Investigate an accident/incident that is required to be reported to FRA under part 225 of this chapter;
 - (ii) Investigate a violation of a Federal railroad safety law, regulation, or order, or the railroad's operating rules and procedures;
 - (iii) Conduct an operational test under § 299.505;
 - (iv) Monitor for unauthorized occupancy of a trainset's cab or operating compartment;
 - (v) Investigate a violation of a criminal law;
 - (vi) Assist Federal agencies in the investigation of a suspected or confirmed act of terrorism; or
 - (vii) Perform inspection, testing, maintenance, or repair activities to ensure the proper installation and functioning of an image or audio recorder as required under paragraph (e)(2) of this section.

(g) *Image recording system approval process.* The railroad must submit for approval a description of the technical

aspects of its trainset image recording system installed pursuant this section. The required description must be submitted via electronic mail to the following email address: *FRARRSMPE@dot.gov*.

(1) The description must specifically address the image recording system's—

- (i) Minimum 12-hour continuous recording capability;
- (ii) Crashworthiness; and
- (iii) Post-accident accessibility of the system's recordings.

(2) The railroad must submit the written statement not less than 90 days before the installation of such image recording system.

(3) The Associate Administrator will review the railroad's description and may approve, or disapprove, the image recording system if it does not meet the requirements of this section. FRA may disapprove any recording systems that do not meet the requirements of this section.

(h) *Relationship to other laws.* Nothing in this section is intended to alter the legal authority of law enforcement officials investigating potential violation(s) of State criminal law(s), and nothing in this section is intended to alter in any way the priority of investigations under 49 U.S.C. 1131 and 1134, or the authority of the Secretary of Transportation to investigate railroad accidents under 49 U.S.C. 5121, 5122, 20107, 20111, 20112, 20505, 20702, 20703, and 20902.

(i) *Removal of an image recording system or device from service and handling for repair.* (1) Notwithstanding the duty established in paragraph (a) of this section to equip trainsets cabs used in revenue service with an image recording system, the railroad—

- (i) May remove from service the entire image recording system or an image recording device in a leading trainset cab used in revenue service for any reason.
- (ii) Must remove from service the entire image recording system or an image recording device in a leading trainset cab used in revenue service if the railroad knows the system or device is not properly recording.

(2) When a railroad removes the entire image recording system or an image recording device in a leading trainset cab used in revenue service from service, a qualified person shall record the date the system or device was removed from service in the trainset's maintenance records.

(3) A trainset on which the entire image recording system, or an image recording device in a leading trainset cab used in revenue service, has been taken out of service as provided in

paragraphs (i)(1)(i) or (ii) of this section may be used as a leading trainset cab in revenue service only until the next pre-service inspection required under the railroad's inspection, testing, and maintenance program.

(4) A trainset with an image recording device that has been taken out of service on only one cab end may be used in revenue service beyond the next pre-service inspection without repair provided the other cab end is the leading end of the trainset and the image recording system is otherwise operative for that cab end.

(5) A trainset with an inoperative image recording device alone is not deemed to be in an improper condition, unsafe to operate, or non-complying under § 299.447. However, a trainset with an entire image record system taken out of service or image recording devices taken out service in both cab ends, may not be used in revenue service beyond the next pre-service inspection required under the railroad's inspection, testing, and maintenance program without repair or replacement of the non-operative system or devices.

(j) *Disabling or interfering with locomotive-mounted audio and video recording equipment.* Any individual who willfully disables or interferes with the intended functioning of image or audio recording system equipment mounted in a leading trainset cab used in revenue service, or who tampers with or alters the data recorded by such equipment, is subject to a civil penalty and to disqualification from performing safety-sensitive functions on a railroad as provided in parts 209 and 218 of this chapter.

(k) *Employee protections.* (1) If inward-facing image or in-cab audio trainset recordings are utilized to conduct operational tests and inspections under § 299.505, the railroad shall adopt and comply with a procedure in its operational tests and inspections program that ensures employees are randomly subject to such operational tests and inspections involving image or audio recordings. The procedure adopted must:

(i) Establish objective, neutral criteria to ensure every employee subject to such operational tests and inspections is selected randomly for such operational tests and inspections within a specified time frame;

(ii) Not permit subjective factors to play a role in selection, *i.e.*, no employee may be selected based on the exercise of the railroad's discretion; and

(iii) Require that any operational test or inspection using trainset image or audio recordings be performed within 72 hours of the completion of the

employee’s tour of duty that is the subject of the operational test. Any operational test performed more than 72 hours after the completion of the tour of duty that is the subject of the test is a violation of this section. The 72-hour limitation does not apply to investigations of railroad accidents/incidents or to violations of Federal railroad safety laws, regulations, or orders, or any criminal laws.

(2) FRA may review the railroad’s procedure implementing paragraph (k)(1) of this section, and, for cause stated, may disapprove such procedure under § 299.505(h).

■ 16. Revise the introductory paragraph of appendix A to part 299 to read as follows:

Appendix A to Part 299—Criteria for Certification of Crashworthy Event Recorder Memory Module

Section 299.439(c) requires that trainsets be equipped with an event recorder that includes a certified crashworthy event recorder memory module. Section 299.449(a)(1) requires the railroad to install an image recording system in its trainsets used in revenue service. As required by § 299.449(a)(4), data from these image recording systems must be recorded on a certified crashworthy memory module or an alternative, remote storage system that provides at least equivalent data protections and is approved by FRA under § 299.15. This

appendix prescribes the requirements for certifying an event recorder memory module (ERMM) or a trainset-mounted audio and/or image recording device memory module as crashworthy. For purposes of this appendix, a trainset-mounted audio or image recording system memory module is also considered an ERMM. This appendix includes the performance criteria and test sequence for establishing the crashworthiness of the ERMM as well as the marking of the event recorder containing the crashworthy ERMM.

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Issued in Washington, DC.

Amitabha Bose,
Administrator.

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