Dear Sir or Madam:

The National Transportation Safety Board (NTSB) has reviewed the Federal Railroad Administration’s (FRA) notice of proposed rulemaking (NPRM) titled “Locomotive Image and Audio Recording Devices for Passenger Trains,” which was published at 84 Federal Register 35712 on July 24, 2019. The NTSB notes the FRA is (1) proposing to require the installation of inward- and outward-facing locomotive image recording devices on all lead locomotives in passenger trains and (2) addressing the use of the recordings to conduct operational tests. To the extent applicable, the NTSB is pleased that the NPRM is partially responsive to our recommendations. However, for the reasons provided in this response, we are disappointed that these long-awaited proposed requirements do not include audio recordings and do not apply to freight railroads—two critical factors identified in numerous accident investigations that have prompted our existing safety recommendations.

The NTSB provides comments on the following: whether to require both passenger and freight railroads to install image recording devices and whether audio recording should be included, the extent to which the proposed requirements should apply to recording devices that are voluntarily installed, whether a specific run-time or shutoff requirement should be included for recording devices, whether additional equipment is needed to address high levels of background noise inside locomotive cabs, recorder technical and crashworthiness issues, whether the recorders should only operate when a train is in motion, the appropriateness of proposed implementation dates, and whether the final rule should include a prohibition on public disclosure of any audio or video recording.

Background

The NTSB has determined that dozens of previous railroad accident investigations would have benefitted from inward- and outward-facing audio and image recorders. In a number of those accidents, the operator died, was seriously injured, or could not recall details from moments before the accident. However, even in the accidents in which the operator was not injured, audio and image recorders could have verified what the operator saw and heard, as well as what actions the operator took during the accident sequence. Such recorded information allows the NTSB to
identify critical safety improvements and issue recommendations to prevent similar accident circumstances from reoccurring. Recorders also definitively document relevant information that regulatory agencies, such as the FRA, often state they require to help justify the costs of implementing safety improvements.

This NPRM was prompted in part by NTSB Safety Recommendations R-97-9, R-07-3, R-10-1 and -2, and reiterations of these recommendations following several other investigations involving both passenger and freight railroads. The currently applicable recommendations issued to the FRA are—

**R-10-1**

Require the installation, in all controlling locomotive cabs and cab car operating compartments, of crash- and fire-protected inward- and outward-facing audio and image recorders capable of providing recordings to verify that train crew actions are in accordance with rules and procedures that are essential to safety as well as train operating conditions. The devices should have a minimum 12-hour continuous recording capability with recordings that are easily accessible for review, with appropriate limitations on public release, for the investigation of accidents or for use by management in carrying out efficiency testing and systemwide performance monitoring programs.

**R-10-2**

Require that railroads regularly review and use in-cab audio and image recordings (with appropriate limitations on public release), in conjunction with other performance data, to verify that train crew actions are in accordance with rules and procedures that are essential to safety.

Safety Recommendations R-10-1 and -2 are classified “Open—Acceptable Response.”

---

1 (a) All recommendations referenced in this letter, as well as relevant excerpts of associated correspondence exchanged to determine a recommendation status, are available via the NTSB Safety Recommendations Database. The database also provides a chart explaining all of the possible recommendation statuses. (b) See the following NTSB reports for additional information: Collision and Derailment of Maryland Rail Commuter MARC Train 286 and National Railroad Passenger Corporation Amtrak Train 29 Near Silver Spring, Maryland, February 16, 1996, RAR-97/02; Collision of Two CN Freight Trains, Anding, Mississippi, July 10, 2005, RAR-07/01; Collision of Metrolink Train 111 With Union Pacific Train LOF65-12 Chatsworth, California, September 12, 2008, RAR-10/01; Collision Involving Three Consolidated Rail Corporation Freight Trains Operating in Fog on a Double Main Track Near Bryan, Ohio, January 17, 1999, RAR-01/01; Collision of BNSF Coal Train With the Rear End of Standing BNSF Maintenance-of-Way Equipment Train, Red Oak, Iowa, April 17, 2011, RAR-12/02; Collision of Two Canadian National Railway Freight Trains near Two Harbors, Minnesota, September 30, 2010, RAR-13/01; Head-On Collision of Two Union Pacific Railroad Freight Trains Near Goodwell, Oklahoma, June 24, 2012, RAR-13/02; Collision of Union Pacific Railroad Freight Train with BNSF Railway Freight Train Near Chaffee, Missouri, May 25, 2013, RAR-14/02; Derailment of Amtrak Passenger Train 188, Philadelphia, Pennsylvania, May 12, 2015, RAR-16/02; and Southwestern Railroad Collision, Roswell, New Mexico, April 28, 2015, RAB-18/04.
The FRA requested comments addressing the benefits of both inward- and outward-facing image and audio recording. These types of recording devices have been extremely beneficial in many accident investigations, including the January 4, 2017, collision of two Southeastern Pennsylvania Transportation Authority trolleys in Philadelphia, Pennsylvania, and the April 3, 2016, Amtrak (National Railroad Passenger Corporation) accident in Chester, Pennsylvania. In both of those investigations, the NTSB used the inward- and outward-facing audio and image recorders to corroborate the statements made by the operating crews and to gather additional visual information about track conditions and the accident sequences.

More recently, the January 31, 2018, collision between an Amtrak passenger train and a refuse truck at an active grade crossing in Crozet, Virginia, demonstrated the benefit of outward-facing image and audio recording. In that accident, the locomotive’s outward-facing image and audio recorder captured the position of the refuse truck, the weather, and the visibility conditions on the train tracks. The recorder showed that the truck was not moving in the moments before the accident; it also captured the sound of the locomotive’s horn as it approached each grade crossing leading up to the accident site.

The NTSB also highlighted the benefits of inward- and outward-facing audio and image recorders in its report on the Amtrak passenger train 501 derailment in DuPont, Washington, on December 18, 2017. In that accident, the locomotive was equipped with an inward-facing image recorder that provided both a visual and audio recording of the crewmember activities during the accident trip. The device was voluntarily installed, and the recorded information proved extremely useful in the NTSB investigation.

The following are important discoveries from the DuPont accident investigation that would have been impossible to determine without the inward- and outward-facing image and audio recorder data:

- It was clear that neither crewmember was using a personal electronic device in the time leading up to the accident; as a result, there was no need to expend time and resources to acquire records or attempt to extract data from crewmembers’ electronic devices.
- The brief conversations between the engineer and the conductor during the trip did not distract them from their operational duties or hamper their ability to identify wayside signs.
- The qualification program for the Point Defiance Bypass, where the accident occurred, did not effectively train and test qualifying crewmembers on the physical characteristics of a new territory.

---


3 See Collision Between Passenger Train and Refuse Truck at Active Grade Crossing, Crozet, Virginia, January 31, 2018, HAB-19/03.

• The engineer’s unfamiliarity with, and fixation on, the audible and visual alerts associated with the overspeed alarm reduced his vigilance of events outside the locomotive moments before the accident.

In our 2019 DuPont accident report, the NTSB concluded that “the FRA has demonstrated an unwillingness to implement the recommendations and regulation that would require inward-facing video and audio devices that are critical to accident investigations and improving safety on our nation’s railroads.” We further concluded that “inward-facing recorders with both image and audio capabilities can increase the understanding of the circumstances of an accident, and, ultimately, provide greater precision in safety recommendations and subsequent safety improvements.” Consequently, we issued the following recommendation to the Secretary of Transportation on June 21, 2019:

R-19-7

Require the Federal Railroad Administration to issue regulations for inward-facing recorders that include image and audio recordings as recommended by the National Transportation Safety Board in R-10-1 and R-10-2.

Safety Recommendation R-19-7 is classified “Open—Await Response.”

Audio Recordings

In the NPRM, the FRA requested comments on the benefits of audio recording and technical specifications for the recordings. The NTSB recognizes that the Fixing America’s Surface Transportation Act of 2015, Public Law 114-94, gives the FRA the discretion to determine whether audio recording devices should be required. However, the NTSB strongly maintains that audio recording, both inward- and outward-facing, should be required as part of a final rule. For more than 10 years, voluntary installations of outward-facing locomotive image and audio recording devices have assisted NTSB investigations. The technology is fully developed and mature, and the devices are readily available as they are already being manufactured, installed, and used.

Regarding technical specifications for audio recordings in the locomotive cab, the NTSB believes the audio recording capabilities that Amtrak has currently voluntarily installed are sufficient. Given that such devices are already being manufactured and that memory storage requirements for audio recording are significantly less than that for image recording, the additional memory storage needed should not be an issue. We recognize there are high levels of background noise inside locomotive cabs; however, based on experience from the DuPont investigation and others, we do not believe that headsets or other specialized audio recording equipment beyond current voluntary installations are necessary to capture crew voice communications.
Image Recordings

The FRA requested comments on technical specifications for image recordings. The NTSB agrees with the proposed rule requiring the automatic switching to infrared, or another operating mode that enables image recording to maintain sufficient clarity, when ambient light levels drop too low for normal image recorder operation. The NPRM discusses potential minimum frame rates for inward- and outward-facing image recordings. The NTSB does not believe that a 5-frames-per-second (fps) recording rate is sufficient for inward-facing image recorders. Locomotive operating compartments contain numerous indicator lights and displays and recording at 5 fps may not adequately capture possible intermittent warnings or indicator lights. We are also not aware of any memory limitations that would necessitate such low frame rates. We believe that at least a 10-fps recording rate should be implemented for inward-facing image recorders. For example, the recorder in the DuPont accident was able to store up to 3.5 days of inward- and outward-facing recordings at 10 fps and 30 fps, respectively, in crash-protected memory. Therefore, we believe that increasing the frame rate requirements above the proposed 5 fps for inward-facing recordings and 15 fps for outward-facing recordings is reasonable because the technology is already being manufactured, installed, and used, and because it will provide needed information for safety reviews or investigations.

Freight Railroads and Voluntary Installations

The NTSB contends that the need for inward- and outward-facing audio and image recorders is not limited to passenger railroad operations, as indicated when we reiterated Safety Recommendations R-10-1 and R-10-2 following our Red Oak, Two Harbors, Chaffee, and Goodwell accident investigations involving freight railroad operations. We have identified the exact same need for these devices in freight railroad investigations as in passenger railroad investigations. These devices help safety investigators gather additional critical information about an entire accident sequence, corroborate statements made by operating crews, and more precisely identify safety issues.

Freight trains and passenger trains operate on the same railroad tracks, posing the risk of accidents that have the potential to significantly affect the public. From a safety management system perspective, it is probable that recorded information about safety problems identified in freight railroad accidents and incidents could help inform, mitigate, or prevent similar safety problems that might potentially affect passenger railroad operations. As a result, we believe it would be shortsighted to limit the proposed rule to passenger railroads. The FRA should ensure one level of safety for both passenger and freight railroads. Further, we firmly believe any such devices that railroads have already voluntarily installed, whether on freight or passenger trains, should be required to meet the minimum standards in the final rule.

Recorder Operation

Regarding the FRA’s question about whether a specific run-time or shutoff requirement should be included in its final rule, the NTSB believes the FRA should require that an inward-facing audio and image recorder actively record anytime a locomotive is powered on, regardless of whether it is moving or stationary. This requirement would help ensure key preaccident events, such as prejob briefings, and critical postaccident events, such as calling
emergency services, are recorded and available to analyze. The NTSB agrees with the FRA’s proposal to deem any locomotive-mounted image or audio recording device or equipment a “safety device” to deter employees from tampering with or disabling such a device. Further, requiring continuous recording while a locomotive is powered on will also help identify those occasions when an employee tampers with or disables a safety device.

The Amtrak/CSX Transportation (CSX) head-on collision that occurred in Cayce, South Carolina, on February 4, 2018, is a recent accident in which it would have been particularly helpful to have recorded audio of crew conversations and to see crew activities while the locomotive was stationary.⁵ In the Cayce accident, the CSX conductor left a switch in the reverse position, which routed the Amtrak train onto a track where it collided head-on with a standing freight train. The CSX conductor and engineer both stated that they discussed the switch position while in their stationary locomotive. If inward-facing image and audio recording had been available, investigators could have verified exactly what the crew said and could have viewed first-hand the circumstances that led to the collision. Therefore, the NTSB does not agree with the FRA’s proposed rule that would give railroads the discretion to decide whether locomotive recording devices would continue to record when a locomotive is not in motion.

The FRA also requested comments addressing the potential risks of overwriting valuable recorded data if an accident occurs in a remote location and recording devices continue to record after a train has stopped. The NTSB has found that major accidents often result in a loss of power in the locomotive, thereby, stopping any recording devices and negating the risk of overwriting accident data. To further address this risk, we believe that railroads should have procedures in place to preserve recordings in the event of less severe accidents that do not result in a loss of power in the locomotive.

The NTSB agrees with the FRA’s proposal that image recordings be recorded on a memory module that meets the requirements of a certified-crashworthy event recorder memory module. However, the NTSB disagrees with the FRA’s proposal that would exempt recorders from crashworthiness requirements when lead locomotive recorder data are immediately transmitted to and stored at a remote location. This exemption would risk the loss of data when an accident occurs in an area where data cannot be reliably transmitted, such as in tunnels and very remote regions. Further, in the case of severe accidents, damage to the recording system could prevent transmission of data to a remote location. If used to supplement onboard recorders, the NTSB recognizes that such data transmission technologies could provide investigators with more timely access to information.

The NTSB also believes the FRA should address buffering in the final rule to ensure that all critical events occurring before an accident are recorded. Frequently saving data to permanent storage from temporary memory—that is, a buffer—will help prevent loss of audio and images due to accidents and power disruptions. The NTSB has had varied success with recording devices capturing the time period before an accident. In the Cayce accident, the outward-facing image and audio recorder did not record critical events before the accident. Instead, the audio stopped

---

⁵ The NTSB Board Meeting for the Cayce accident was held on July 23, 2019. The report, *Amtrak Passenger Train Head-on Collision With Stationary CSX Freight Train, Cayce, South Carolina, February 4, 2018*, will be available on the NTSB Accident Reports webpage soon.
recording a few minutes before the accident, and the image recording stopped about a minute before the accident. As a result, there was no recording of the misaligned switch. In the DuPont accident, the inward- and outward-facing image and audio recordings captured critical events up to the time of derailment.

Phase-in Timeline

The NTSB recognizes the FRA’s proposal for a 4-year deadline for the installation of locomotive image recording systems will encourage the prompt implementation of the requirements in the final rule. The NTSB’s 2019 DuPont accident report again showed that there is a clear investigative benefit to the information obtained from locomotive image and audio recording devices. However, the NTSB notes that it has been more than 9 years since Safety Recommendation R-10-1 was issued; any further delays beyond the proposed 4-year deadline would be unacceptable.

Privacy Issues

The FRA requested comments addressing the privacy implications of recordings made during down times when a train crew might not be actively performing safety-related duties. The NTSB appreciates the sensitive nature of these recordings; however, safety-related duties frequently take place when locomotives are stationary, and there is no reliable way to limit recordings to only capture safety-related activities. As stated earlier, the NTSB believes the FRA should require that an inward-facing audio and image recorder actively record anytime a locomotive is powered on, regardless of whether it is moving or stationary.

The FRA also raised a question in the NPRM about including a specific provision that prohibits the public release of an image or audio recording by any railroad or person. To address this issue, the NTSB recommended that the FRA ensure that railroads have appropriate limitations established on the public release of in-cab audio and image recordings (R-10-2).

The NTSB 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 we investigate. Title 49 United States Code sections 1114(c) and (d) prohibit the NTSB from publicly disclosing voice and video recordings from inside aircraft cockpits, locomotive cabs, and other surface vehicles involved in accidents or incidents. The law also specifies the circumstances under which the NTSB shall make public an audio transcript or written depiction of visual information relevant to an accident or incident. The NTSB never publicly releases the recordings. At the conclusion of our investigations, we return a recorder and all other evidence collected to its respective owner. Therefore, the NTSB believes the current federal law that protects against the public release of these recordings during our investigations is sufficient.
Final Comment

The NTSB strongly urges the FRA to issue a final rule requiring both passenger and freight railroads to install locomotive recorders that include inward- and outward-facing image and audio recording. The safety of the traveling public demands it. We appreciate the opportunity to comment on this NPRM.

Sincerely,

Robert L. Sumwalt, III
Chairman