



# National Transportation Safety Board

Washington, DC 20594

## Safety Recommendation

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**Date:** July 8, 2015

**In reply refer to:** R-15-28 through -30

Mr. Joseph H. Boardman  
President and Chief Executive Officer  
National Railroad Passenger Corporation  
60 Massachusetts Ave. NE  
Washington, DC 20002

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The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

Based on the NTSB's ongoing investigation of the derailment of the National Railroad Passenger Corporation (Amtrak) passenger train 188 on May 12, 2015, we are issuing safety recommendations that address the installation of inward- and outward-facing audio and image recorders in this letter. We appreciate that Amtrak has installed outward-facing cameras and has announced plans to install inward-facing video cameras in some locomotive cabs and cab car operating compartments. However, the installed outward-facing cameras are not fire and crash protected, and Amtrak's announcement does not address the technical specification for the inward-facing cameras, a plan or schedule for installation, how Amtrak intends to use the recorded images, or the need to record in-cab audio in addition to video. Facts supporting the NTSB's recommendations are presented below.

### **Factual Information**

About 9:21 p.m. on May 12, 2015, Amtrak passenger train 188 derailed at milepost 81.62 near Frankfort Junction in Philadelphia, Pennsylvania. The tracks in the area of the derailment have a 4-degree curve with a permanent speed restriction of 50 mph. Event recorder data indicated the train was traveling 106 mph when the engineer made an emergency brake application; soon afterward, the train derailed at the curve. There were 250 passengers and

8 Amtrak employees on board. Eight passengers died, and more than 200 passengers were treated for injuries.

## **Background**

The NTSB has long advocated the use of recording devices inside locomotive cabs as an aid in accident investigations and for use by transportation management in efficiency testing and performance monitoring programs. Our initial recommendation for “voice recorders” came as a result of our investigation into the 1996 collision of a Maryland Rail Commuter (MARC) train—operated by CSX Transportation (CSXT)—and an Amtrak train near Silver Spring, Maryland. Eleven people died, including all three CSXT operating crewmembers.<sup>1</sup> We reiterated this safety recommendation in our investigation of the 1999 Bryan, Ohio, railroad accident where there were no surviving crewmembers.<sup>2</sup> However, the Federal Railroad Administration (FRA) stated that no action would be taken to implement the recommendation. Since the FRA’s refusal to act on the recommendation of in-cab audio recorders, the NTSB has investigated additional accidents in which audio recorders would have provided information to help determine probable cause and improve safety. That was underscored by a 2005 collision in Anding, Mississippi. All four crew members were killed, and 15,000 gallons of diesel fuel was spilled, causing a fire and the evacuation of 100 residents.<sup>3</sup> Autopsies with toxicological specimens could not be performed on the northbound crewmembers, so the NTSB could not determine if they were incapacitated before the accident, prompting us to expand our previous recommendation. As a result, in issuing recommendations to the FRA after investigating this accident, the NTSB included a recommendation to require the installation of inward-facing video recorders in all controlling locomotive cabs and cab car operating compartments.<sup>4</sup>

However, the benefit of recording audio and images of operating crew members is not limited to investigations. These recordings could help railroad management prevent accidents by identifying safety issues before they lead to injuries and loss of life by using them to develop valuable training tools. The Chatsworth, California, tragedy demonstrated the importance of understanding the activities of crewmembers in the minutes and seconds leading up to an accident.<sup>5</sup> Twenty-five people were killed and 102 were injured as a result of this accident. The NTSB found that the probable cause of the accident was the failure of the Metrolink engineer to respond to a red signal because he was texting. Our investigation revealed the engineer had a history of noncompliance with Metrolink’s operating rules. Discussing the strong safety case for a requirement for inward-facing cameras in locomotives, the NTSB noted that:

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<sup>1</sup> National Transportation Safety Board, *Collision and Derailment of Maryland Rail Commuter MARC Train 286 and National Railroad Passenger Corporation Amtrak Train 29 Near Silver Spring, Maryland, on February 16, 1996*, RAR-97/02 (Washington, DC: National Transportation Safety Board, 1997).

<sup>2</sup> National Transportation Safety Board, *Collision Involving Three Consolidated Rail Corporation Freight Trains Operating in Fog on a Double Main Track Near Bryan, Ohio, January 17, 1999*, (Washington, DC: National Transportation Safety Board, RAR-01/01, 2001).

<sup>3</sup> National Transportation Safety Board, *Collision of Two CN Freight Trains, Anding, Mississippi, July 10, 2005*, RAR-07/01 (Washington, DC: National Transportation Safety Board, 2007).

<sup>4</sup> R-07-3.

<sup>5</sup> National Transportation Safety Board, *Collision of Metrolink Train 111 With Union Pacific Train LOF65-12, Chatsworth, California, September 12, 2008*, RAR-10/01 (Washington, DC: National Transportation Safety Board, 2010).

(I)n all too many accidents, the individuals directly involved are either limited in their recollection of events or, as in the case of the Chatsworth accident, are not available to be interviewed because of fatal injuries. In a number of accidents the NTSB has investigated, a better knowledge of crewmembers' actions before an accident would have helped reveal the key causal factors and would perhaps have facilitated the development of more effective safety recommendations.<sup>6</sup>

Accordingly, the NTSB enhanced its earlier recommendation and called for the FRA to require the installation, in control compartments, of “crash- and fire-protected inward- and outward-facing audio and image recorders capable of providing recordings [for at least 12 hours] to verify that train crew actions are in accordance with rules and procedures that are essential to safety as well as train operating conditions.”<sup>7</sup> The NTSB also recommended that the FRA “[r]equire that railroads regularly review and use in-cab audio and image recordings . . . to verify that train crew actions are in accordance with rules and procedures that are essential to safety.”<sup>8</sup>

The NTSB reiterated these important recommendations in its report on the collision of a BNSF coal train with the rear end of a standing BNSF maintenance-of-way equipment train near Red Oak, Iowa, resulting in the deaths of the two crewmembers of the striking train.<sup>9</sup> The accident again demonstrated the need for in-cab audio and image recording devices to better understand—and, thereby, prevent—railroad crashes that claim the lives of crewmembers, passengers, and the public.

Subsequent to the Red Oak, Iowa, accident, the NTSB investigated the June 2012 collision of two Union Pacific freight trains near Goodwell, Oklahoma, that resulted in three crewmember fatalities and \$14.8 million in estimated damage.<sup>10</sup> In the NTSB Accident Report, we noted that the FRA had failed to take action on the NTSB's two recommendations from the 2010 Chatsworth accident for in-cab audio and image recording devices and again reiterated these two recommendations.

The NTSB recognizes the significant privacy concerns regarding the public disclosure of audio and image recordings. Congress also has been sensitive to the public disclosure of these sensitive data and information after transportation accidents. For this reason, in 1990, it enacted confidentiality protections that prohibit the NTSB from publicly disclosing aviation cockpit voice recordings and from prematurely disclosing transcripts of oral communications by flight crewmembers.<sup>11</sup> In 2000, it enacted similar confidentiality protections prohibiting the public disclosure of aviation cockpit video recordings and surface vehicle voice or video recordings, as well as premature disclosure of aviation cockpit video transcripts and surface vehicle voice or

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<sup>6</sup> National Transportation Safety Board, *Collision of Metrolink Train 111 With Union Pacific Train LOF65-12, Chatsworth, California, September 12, 2008*, RAR-10/01 (Washington, DC: National Transportation Safety Board, 2010).

<sup>7</sup> R-10-1.

<sup>8</sup> R-10-2.

<sup>9</sup> National Transportation Safety Board, *Collision of BNSF Coal Train With the Rear End of Standing BNSF Maintenance-of-Way Equipment Train Red Oak, Iowa on April 17, 2011*, RAR-12/02 (Washington, DC: National Transportation Safety Board, 2012).

<sup>10</sup> National Transportation Safety Board, *Head-On Collision of Two Union Pacific Railroad Freight Trains Near Goodwell, Oklahoma, June 24, 2012*, RAR-13/02 (Washington, DC: National Transportation Safety Board, 2012).

<sup>11</sup> Independent Safety Board Act Amendments of 1990, Pub. L. 101-641, § 3(b), codified at 49 U.S.C. § 1114(c).

video transcripts of oral communications of train employees or other surface transportation operating employees.<sup>12</sup> Congress also precluded litigants from using discovery to obtain cockpit and surface vehicle recordings and transcripts in any judicial proceeding.<sup>13</sup>

Audio and image recorders in locomotives and cab car operating compartments are critically important because they assist NTSB investigators and others with understanding what happened in a train before an accident. During interviews, the engineer of Amtrak 188 has stated that he cannot recall the events leading up to the derailment. So far, investigators have been unable to determine specific information about the engineer's behavior while the train was accelerating in the moments before the derailment. The Amtrak 188 accident in Philadelphia is only the latest example where the engineer's recollection of events is limited, and inward-facing recorders could have provided valuable information as NTSB determines the probable cause of this tragic accident. The following table lists rail accidents in which the NTSB recommended the use of audio and/or image recorders in the cab. In almost all cases, the NTSB's investigations were hampered by the lack of audio and/or image data.

**Table 1.** Damages incurred in previous accidents.

Location	Date	Fatalities	Injuries	Damages/Costs
Silver Spring, MD	Feb. 16, 1996	11	26	\$7.5 million
Bryan, Ohio	Jan. 17, 1999	2		\$5.3 million
Gunter, TX <sup>a</sup>	May 19, 2004	1	4	\$2.1 million
Macdona, TX <sup>b</sup>	June 28, 2004	3	32	\$5.85 million
Anding, MS	July 10, 2005	4		\$10.1 million
Texarkana, AR <sup>c</sup>	Oct. 15, 2005	1		\$2.3 million
Chatsworth, CA	Sept. 12, 2008	25	102	\$12 million
Two Harbors, MN	Sept. 30, 2010		5	\$8.1 million
Red Oak, Iowa	April 17, 2011	2		\$8.7 million
Goodwell, OK	June 24, 2012	3		\$14.8 million
Chaffee, MO <sup>d</sup>	May 25, 2013		2	\$11 million
Bronx, NY	Dec. 1, 2013	4	59	\$9 million
<b>Total:</b>		<b>56</b>	<b>230</b>	<b>\$96.75 million</b>

<sup>a</sup> National Transportation Safety Board, *Collision Between Two BNSF Railway Company Freight Trains Near Gunter, Texas, May 19, 2004*, RAR-06/02 (Washington, DC: National Transportation Safety Board, 2006).

<sup>b</sup> National Transportation Safety Board, *Collision of Union Pacific Railroad Train MHOTU-23 With BNSF Railway Company Train MEAP-TUL-126-D With Subsequent Derailment and Hazardous Materials Release, Macdona, Texas, June 28, 2004*, Railroad Accident Report NTSB/RAR-06/03 (Washington, DC: NTSB, 2006).

<sup>c</sup> National Transportation Safety Board, *Collision of Two Union Pacific Railroad Freight Trains, Texarkana, Arkansas, October 15, 2005*, Railroad Accident Brief NTSB/RAB-06/04 (Washington, DC: NTSB, 2006).

<sup>d</sup> National Transportation Safety Board, *Collision of Union Pacific Railroad Freight Train with BNSF Railway Freight Train Near Chaffee, Missouri, May 25, 2013*, RAR-14/02 (Washington, DC: National Transportation Safety Board, 2014).

Recently, two NTSB investigations were aided by inward-facing audio and image recorders in two rail investigations. In a 2013 accident in which a Bay Area Rapid Transit train struck roadway workers, a digital audio and video recorder was mounted above the operator's seat in the lead car.<sup>14</sup> It was positioned to record the operator and the car control panel. The

<sup>12</sup> National Transportation Safety Board Amendments Act of 2000, Pub. L. 106-424, § 5, codified at 49 U.S.C. § 1114(d).

<sup>13</sup> 49 U.S.C. § 1154.

<sup>14</sup> National Transportation Safety Board, *Bay Area Rapid Transit Train 963 Struck Roadway Workers, Walnut Creek, California, October 19, 2013*, RAB-15/02 (Washington, DC: National Transportation Safety Board, 2015).

information gathered from the recording helped verify the accident sequence and provided an accurate timeline of events. In a second case, a Metrolink commuter train collided with a truck tractor on February 24, 2015, in Oxnard, California. The Metrolink locomotive was equipped with inward- and outward-facing audio and image recorders. Although the investigation is ongoing, the information provided by the inward-facing audio and image recorder has been critical in corroborating the engineer's description of events.

The need for recorded information—including audio and images—for operational and safety oversight is an important issue across transportation modes. The NTSB has made recommendations in aviation that address this issue for large transport category aircraft operations, as well as helicopter emergency services operations. Similarly, the NTSB issued recommendations for heavy commercial highway vehicles to require that motor carrier operators use recorded information for operational and safety oversight.

### **Recommendations**

The NTSB continues to believe inward- and outward-facing audio and image recorders improve the quality of accident investigations and provide the opportunity for proactive steps by railroad management to improve operational safety. We have been encouraged by the inclusion of these recommendations in previously proposed rail safety legislation, and we hope this can be part of a rail safety legislative proposal that may be considered by this Congress. We are also encouraged that two Class I railroads and some commuter railroads have proceeded with installing in-cab audio and image recorder devices in their locomotives. We will continue to address the recommendation with individual railroads and with the FRA. In a May 26, 2015, press release, Amtrak announced it will install inward-facing video cameras in its ACS-64 locomotives that operate on the Northwest corridor by the end of 2015. Amtrak also announced it is developing a plan to install inward-facing cameras on the rest of the fleet. The NTSB is encouraged by this statement, but believes that additional requirements for a complete inward- and outward-facing audio and image recorder system are necessary. Because of this, the National Transportation Safety Board makes the following recommendations to the National Railroad Passenger Corporation:

Install, in all controlling locomotive cabs and cab car operating compartments, 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-15-28)

Semi-annually, issue a public report detailing Amtrak's progress in installing crash- and fire-protected inward- and outward-facing audio and image recorders. The report should include the number of locomotives and cab car operating compartments that have been equipped with the recorders, as well as the number of locomotives and cab car operating compartments in Amtrak's fleet that still lack those devices. (R-15-29)

Regularly review and use in-cab audio and image recordings in conjunction with other performance data to verify crewmember actions are in accordance with rules and procedures that are essential to safety. (R-15-30)

We are also reiterating recommendations R-10-1 and R-10-2, which require inward- and outward-facing audio and image recorders, to the Federal Railroad Administration.

Chairman HART, Vice Chairman DINH-ZARR, and Members SUMWALT and WEENER concurred in these recommendations.

The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives. We would appreciate receiving a response from you within 90 days detailing the actions you have taken or intend to take to implement it. When replying, please refer to the safety recommendation by number. We encourage you to submit your response electronically to [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov). If it exceeds 10 megabytes, including attachments, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

[Original Signed]

By: Christopher A. Hart,  
Chairman