



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: August 15, 2003

In reply refer to: R-03-09 through -11

Mr. David L. Gunn
President and Chief Executive Officer
National Railroad Passenger Corporation
60 Massachusetts Avenue, N.E.
Washington, D.C. 20002

The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable causes, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendations in this letter. The Safety Board is vitally interested in these recommendations because they are designed to prevent accidents and save lives.

These recommendations address means of end-of-train (EOT) device activation, National Railroad Passenger Corporation (Amtrak) passenger accountability procedures, and securement of folding armchairs on Amtrak Superliner sleeper cars. The recommendations are derived from the Safety Board's investigation of the derailment of Amtrak Auto Train P052-18 near Crescent City, Florida, on April 18, 2002, and are consistent with the evidence we found and the analysis we performed.¹

About 5:08 p.m. eastern daylight time on April 18, 2002, northbound Amtrak train P052-18, the Auto Train, derailed 21 of 40 cars on CSX Transportation (CSXT) track near Crescent City, Florida. The train derailed in a left-hand curve while traveling about 56 mph. The train was carrying 413 passengers and 33 Amtrak employees. The derailment resulted in 4 fatalities, 36 serious injuries, and 106 minor injuries. The equipment and track costs associated with the accident totaled about \$8.3 million.

The Safety Board determined that the probable cause of the derailment was a heat-induced track buckle that developed because of inadequate CSX Transportation track-surfacing operations, including misalignment of the curve, insufficient track restraint, and failure to reestablish an appropriate neutral rail temperature.

As a result of its investigation, the Safety Board has issued eight safety recommendations, three of which are addressed to Amtrak. Information supporting the

¹ For additional information, see National Transportation Safety Board, *Derailed of Amtrak Auto Train P052-18 on the CSXT Railroad Near Crescent City, Florida, April 18, 2002*, Railroad Accident Report NTSB/RAR-03/02 (Washington, DC: NTSB, 2003).

recommendations is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendations.

Although the investigation showed that Amtrak was not responsible for causing the accident, it also showed that several Amtrak practices could be improved. In the first place, the Safety Board found that the EOT device was not activated as quickly as would have been desirable after the train encountered the track buckle.

According to locomotive event recorder information, it was not until about 10 seconds after the engineer put the train in emergency and about 7 seconds after the air brakes went into emergency that the emergency braking signal actually reached the rear of the train. There were likely two reasons for this time gap; a pinched trainline air hose between cars and the engineer's delay in activating the two-way EOT device to initiate an emergency brake application at the rear end.

Investigators deduced that a pinched trainline air hose between cars kept the pneumatic signal from reaching the rear of the train when the air brakes went into emergency at the head end. About 7 seconds later, the derailment forces caused a break in the trainline air hose beyond the pinched area, which caused the remainder of the train to go into emergency. The engineer did not activate the EOT device until about 15 seconds after he had put the train into emergency. By that time, the EOT device activation was unnecessary, because the full train was already in emergency due to the break in the trainline.

Had the engineer immediately activated the two-way EOT device when he put the air brakes in emergency, the rear of the train would have gone into emergency with the head end, which would have minimized car movement. The 7-second delay between the train's air brakes going into emergency and the emergency signal reaching the end of the train allowed the cars at the rear of the train to continue to move into the forward cars, which were braked and/or stopping.

The delay would have been avoided if the two-way EOT device had been automatically activated at the same moment the engineer put the train's air brakes in emergency. The Safety Board has previously discussed the benefits of automatic activation of EOT devices on trains. In the Bloomington, Maryland, freight train accident report,² the Safety Board noted that CSXT had installed automatic two-way EOT devices on all its new locomotives. However, this was not the case. CSXT had actually installed automatic-*ready* two-way EOT devices, which could not, when installed, effect the simultaneous, automatic application of the brakes at the end of the train with the engineer's emergency application of the brakes. To function properly, the installed devices need the additional installation of a computer card encoded with the necessary information technology (software). This technology was not yet available when CSXT installed the devices nor at the time of the Crescent City derailment. Since the Crescent City accident, however, automatic two-way EOT application technology (as provided through the encoded computer cards) has reached the final development stage and should soon be ready for use.

² National Transportation Safety Board, *Derailment of CSX Transportation Coal Train V986-26 at Bloomington, Maryland, January 30, 2000*, Railroad Accident Report NTSB/RAR-02/02 (Washington, DC: NTSB, 2002).

The Safety Board concluded that had the two-way EOT device been activated when the Auto Train's air brakes were put in emergency, the severity of the injuries resulting from the derailment might have been lessened, because the continued forward momentum of the majority of the train's cars into the stopped passenger cars would have been reduced. At the time of the accident, Amtrak locomotives were not equipped with automatic two-way EOT devices. Consequently, the Safety Board believes that Amtrak should install automatic two-way EOT emergency activation devices on all Amtrak locomotives equipped with manual devices.

A second issue that arose during the investigation was passenger accountability. The accident Auto Train was an all-reserved passenger train that was to travel nonstop between Sanford, Florida, and Lorton, Virginia. To account for the Auto Train passengers, Amtrak was using the paper on-board record system described in its *Service Standards Manual for Management Employees*. Given that the train made no scheduled stops for passengers, if this had been a reliable system, Amtrak should have been able to determine soon after the train departed from Sanford exactly how many passengers were on board the Auto Train by using the passenger manifest and the contents of the conductor's ticket collections pouch. Even though the accident occurred only about an hour after the train departed from Sanford, this still should have been sufficient time to develop a comprehensive list. Nevertheless, the incident commander told investigators that he had difficulty obtaining accurate information from Amtrak about the number of people on board the train.

When he arrived on the scene on April 18, the incident commander was told that 468 people were on the train. Subsequently, he was provided with both a greeter list and a passenger list, but the information on the two lists did not match. The incident commander later complained that emergency responders had to spend time attempting to verify the accuracy of the two lists. The day after the accident, Amtrak gave the incident commander a computer printout list, which contained information that did not match either of the two lists provided on April 18. In fact, Amtrak never provided the incident commander an accurate count of the persons on board the train. Even during postaccident interviews, long after the initial emergency response, Amtrak was still erroneously reporting the total number of people on board the train as 468.

Using information gathered and correlated from three sources—Amtrak, Putnam County Emergency Services, and medical records—it took Safety Board investigators almost 5 months to determine the number of Auto Train occupants at the time of the accident. The total number of people on board the train was 446, a discrepancy of 22 from the figure of 468 people that Amtrak gave in the immediate response phase.

In a derailment, the survival of passengers and crewmembers might well depend on emergency responders, who in turn depend on a complete and accurate accounting of all people on the train to ensure that they locate, evacuate, and treat (if necessary) all those on board. If the passenger list does not include every passenger on the train, emergency responders may leave passengers behind. If the passenger list includes people not on the train, emergency responders may be needlessly exposed to prolonged risks as they search for nonexistent passengers. To facilitate an effective emergency response, the incident commander must have an accurate passenger list as soon as possible.

This is not the first time the Safety Board has identified passenger accountability as an issue in an Amtrak accident. Following the September 1993 Amtrak accident in Mobile, Alabama,³ in September 1994, the Safety Board recommended that Amtrak:

R-94-7

Develop and implement procedures to provide adequate passenger and crew lists to local authorities with minimum delay in emergencies.

Amtrak responded to the recommendation with a plan to develop a satellite and long-distance messaging system between long-distance trains and corporate offices. One benefit of this proposed new communications system was to be improved passenger manifests. However, following a 1997 Amtrak accident in Kingman, Arizona,⁴ Amtrak told the Safety Board that passenger manifests were unrealistic on unreserved trains, due to the number of station stops such trains make. Amtrak indicated, however, that computer systems could provide passenger lists for reserved trains. As a result of this new information, the Safety Board closed Safety Recommendation R-94-7 (Reconsidered) on August 31, 1998, and issued a new recommendation urging Amtrak to:

R-98-58

Expedite the development and implementation of a passenger and crew accountability system on reserved trains.

On September 14, 1999, the president of Amtrak Intercity testified during the Safety Board's public hearing on the Bourbonnais, Illinois, accident⁵ that Amtrak had made an investment of \$24 million and contracted with Motorola to develop an automated system for accounting for train passengers. He described the system as a simple hand-held device to be used by the conductor, which would scan the tickets and record a passenger name. There was to be a central processing unit on the train for downloading information from the hand-held device. This information was to be transmitted to the Amtrak national reservation system and made available to a number of locations. As such, the passenger data would be readily available to emergency responders. The Amtrak official said the system was scheduled for implementation in 2000.

Because Amtrak had indicated that an automated passenger accountability system was in imminent development, the Safety Board classified Safety Recommendation R-98-58 "Closed--Acceptable Action" on December 5, 2000. However, Amtrak has not implemented such an accountability system. Since Safety Recommendation R-98-58 was closed, Amtrak has failed to provide a timely and accurate passenger count to emergency responders during at least four

³ National Transportation Safety Board, *Derailment of Amtrak Train No. 2 on the CSXT Big Bayou Canal Bridge Near Mobile, Alabama, September 22, 1993*, Railroad Accident Report NTSB/RAR-94/01 (Washington, DC: NTSB, 1994).

⁴ National Transportation Safety Board, *Derailment of Amtrak Train 4, Southwest Chief, on the Burlington Northern Santa Fe Railway near Kingman, Arizona, August 9, 1997*, Railroad Accident Report NTSB/RAR-98/03 (Washington, DC: NTSB, 1998).

⁵ National Transportation Safety Board, *Collision of National Railroad Passenger Corporation (Amtrak) Train 59 With a Loaded Truck-Semitrailer Combination at a Highway/Rail Grade Crossing in Bourbonnais, Illinois, March 15, 1999*, Railroad Accident Report NTSB/RAR-02/01 (Washington, DC: NTSB, 2002).

Amtrak accidents (including this one).⁶ Earlier this year, an Amtrak official stated in a letter⁷ to a Safety Board staff member:

While Amtrak continues to explore realistic technological alternatives to enhance the efficiency of recording ticketed and non-ticketed passengers, we feel that the passenger accountability system presently in place is a reliable one.

Therefore, Amtrak still uses, and appears likely to continue to use, the paper on-board record system outlined in its *Service Standards Manual for Management Employees* to account for passengers on its long-distance, overnight, and reserved trains. However, as the Crescent City accident indicated, this system is prone to error, delay, and confusion. The system could not provide an accurate list months after the accident, much less during the crucial emergency response period. Therefore, the Safety Board concluded that the paper record passenger accountability system in use for long-distance, overnight, and reserved trains on the Amtrak system cannot be relied upon to provide an accurate and timely passenger manifest in case of emergency.

Amtrak uses the same paper record system that performed so poorly on the Auto Train for all its long-distance, overnight, and reserved trains. Since issuing Safety Recommendation R-94-7 nearly 9 years ago, the Safety Board has investigated nine accidents involving Amtrak trains in which passenger accounting has been less than satisfactory during the emergency response. As has been noted, the Safety Board has repeatedly made recommendations to Amtrak concerning this issue, and Safety Board staff members have met with Amtrak representatives both formally and informally to resolve this longstanding problem. To date, Amtrak has not taken effective action to address this safety issue. Consequently, the Safety Board believes that Amtrak should develop and implement an accurate passenger and crew accountability system for all its long-distance, overnight, and reserved trains that will immediately provide an accurate count of the people on board the train in case of emergency.

Finally, the investigation indicated that the unsecured folding armchairs on Amtrak Superliner sleeper cars may injure passengers during a derailment or similar emergency. As currently configured, each deluxe bedroom in an Amtrak Superliner sleeper car contains an unsecured folding armchair. Two Auto Train passengers reported that they were injured during the derailment when they were struck by such armchairs or when they were thrust out of the armchairs, indicating that the unsecured armchairs pose an occupant injury hazard during a derailment.

Federal Railroad Administration (FRA) regulations state, at 49 *Code of Federal Regulations* 238.233, that passenger railcar seating fixtures “ordered on or after September 8, 2000, or placed in service for the first time on or after September 9, 2002,” must be securely fastened to the car body. Anchoring occupant seating substantially reduces the risk of occupants

⁶ The other three accidents took place in Syracuse, New York, in February 2001; Nodaway, Iowa, in March 2001; and Kensington, Maryland, in July 2002.

⁷ Letter dated March 14, 2003, from Amtrak Chief Transportation Officer, Operations Standards and Compliance, to Safety Board investigator concerning the July 29, 2002, Amtrak Train 30 derailment in Kensington, Maryland.

being injured by the seating in a derailment. However, because the Amtrak Superliner cars involved in this accident were put in service before September 8, 2000, the FRA requirements concerning seating anchoring are not applicable to them. Although Amtrak has indicated that it is pursuing an equipment remedy, some Amtrak trains currently travel with unsecured folding armchairs on Superliner sleeper cars. The Safety Board concluded that in its present unsecured configuration, the folding armchair on Amtrak's Superliner sleeper cars constitutes an unwarranted hazard. Therefore, the Safety Board believes that Amtrak should, within 1 year, install restraint systems for the unsecured folding armchairs in all its in-service Superliner sleeper cars. The restraint systems should meet the safety criteria established at 49 *Code of Federal Regulations* 238.233.

Therefore, the National Transportation Safety Board makes the following safety recommendations to the National Railroad Passenger Corporation (Amtrak):

Install automatic two-way end-of-train emergency activation devices on all Amtrak locomotives equipped with manual devices. (R-03-09)

Develop and implement an accurate passenger and crew accountability system for all Amtrak long-distance, overnight, and reserved trains that will immediately provide an accurate count of the people on board the train in case of emergency. (R-03-10)

Within 1 year, install restraint systems for the unsecured folding armchairs in all your in-service Superliner sleeper cars. The restraint systems should meet the safety criteria established at 49 *Code of Federal Regulations* 238.233. (R-03-11)

The Safety Board also issued safety recommendations to CSX Transportation, Inc., the Federal Railroad Administration, and the Transportation Security Administration. In your response to this letter, please refer to Safety Recommendations R-03-09 through -11. If you need additional information, you may call (202) 314-6177.

Chairman ENGLEMAN, Vice Chairman ROSENKER, and Members GOGLIA, CARMODY, and HEALING concurred in these recommendations.

Original Signed

By: Ellen G. Engleman
Chairman