

NATIONAL TRANSPORTATION SAFETY BOARD
Public Meeting of July 23, 2019
(Information subject to editing)

Amtrak Passenger Train Head-on Collision With Stationary CSX Freight Train
Cayce, South Carolina
February 4, 2018
RRD18MR003

This is a synopsis from the NTSB's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. NTSB staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing to reflect changes adopted during the Board meeting.

Executive Summary

On February 4, 2018, about 2:27 a.m. eastern standard time, southbound Amtrak (National Railroad Passenger Corporation) train P91, operating on a track warrant, was diverted from the main track through a reversed hand-throw switch into a track and collided head-on with a stationary CSX Transportation (CSX) local freight train F777. The accident occurred on CSX's Florence Division, Columbia Subdivision in Cayce, South Carolina.

The engineer and conductor of the Amtrak train died because of the collision. Ninety-one passengers and crew members on the Amtrak train were transported to medical facilities. The engineer of the stopped CSX train had exited the lead locomotive before the Amtrak train entered the track, ran to safety, and was not injured. The conductor on the CSX lead locomotive saw the Amtrak train approaching on the track and ran to the back of locomotive. The conductor was thrown off the locomotive and sustained minor injuries. Damage was estimated at \$25.4 million.

The normal method of operation on this segment of track was by wayside signal indications of a traffic control system. On the day prior to the accident, CSX signal personnel began upgrading signal system components to implement positive train control on the subdivision. Signal personnel ceased work for the day at 7:00 p.m., prior to completing planned work. The signal suspension remained in place resulting in the continued use of track warrants to move trains through the affected area of signal suspension.

As a result of the initial findings of this investigation on February 15, 2018, the NTSB issued Safety Recommendation R-18-05 to the Federal Railroad Administration (FRA). This urgent recommendation asked the FRA to issue an emergency order providing instructions for railroads to follow when signal suspensions are in effect, and a switch has been reported relined for a main track.

The FRA chose not to issue an Emergency Order, instead proposing a Safety Advisory. On November 20, 2018, the FRA published the Safety Advisory.

The accident investigation focused on the following safety issues:

- The medical examination process for railroad employees.
- The actions and responsibilities of the train crew handling switches.
- CSX efficiency testing program and staffing.
- Operations during signal suspensions.
- Implementation of a Safety Management System by Amtrak to assess and mitigate risks for operation on host railroads.
- Occupant protection in passenger railcars.

Findings

1. The National Transportation Safety Board concludes that none of the following was a factor in this accident: the mechanical readiness of the train or the condition of the track.
2. No medical condition or use of any medication by the Amtrak train crew contributed to the circumstances of the accident.
3. Due to the limited available medical information for the CSX Transportation train crew, it could not be determined whether any medical condition or use of medication contributed to the circumstances of the accident.
4. The majority of passenger injuries resulted from the passengers being thrown from their seats when the trains collided and derailed.
5. Although the passenger equipment safety standards in Title 49 *Code of Federal Regulations* Part 238 provide some level of protection for occupants, the current requirements are not adequate.
6. The two-person train crew performing switching that required the use of main track switches would have benefited from an additional train crew member assisting with the operation of the main track switches, because in this unique situation, the signal system did not provide a second level of safety for the operation of the main track switch.
7. The CSX Transportation train crew performed switching operations in the accident area for about 6 hours in a changed operating environment of a signal suspension without sufficient planning, a risk assessment, and implementation of appropriate risk mitigation.

8. The changed environment of a signal suspension not only challenges the movement of trains and operating crews but also limits the effectiveness of the operating rules and regulations.
9. The CSX Transportation crew efficiency tests for the operation of main track switches, East Coast (EC-1) authority, or the Switch Position Awareness Form failed to ensure safety.
10. The CSX Transportation conductor's failure to realign the North End Silica Storage switch was an error of omission.
11. The Switch Position Awareness Form is an ineffective control that did not mitigate the risk of an improperly lined switch.
12. CSX Transportation failed to properly assess and mitigate the risk associated with conducting switching operations with the signals suspended.
13. The Federal Railroad Administration has failed to implement effective regulation to mitigate the risk of misaligned switch accidents.
14. Amtrak has not yet articulated, nor implemented, a strategy to integrate all aspects of host railroad operations into its Safety Management System.
15. This accident again shows that to improve safety for the public, Amtrak needs to implement a Safety Management System on all operations whether internal or on a host railroad.
16. The application of safety management principles must be uniform across the Amtrak network.
17. To improve its risk management processes, CSX will need to develop and implement a Safety Management System.
18. Repeated postponement of Title 49 *Code of Federal Regulations* Part 270, System Safety Program, by the Federal Railroad Administration has delayed needed safety improvements for the passenger rail industry and the traveling public.

Probable Cause

The National Transportation Safety Board determines the probable cause of this collision of trains was the failure of the CSX Transportation Corporation to assess and mitigate the risk associated with operating through a signal suspension, which created conditions that permitted the crew of CSX local freight train F777 to leave a switch in the reverse position, routing National Railroad Passenger Corporation (Amtrak) train P91 onto a track where it collided with a standing CSX train. Contributing to the accident was the Federal Railroad Administration's failure to implement effective regulation to mitigate the risk of misaligned switch accidents. Also contributing to the accident was Amtrak's failure to conduct a risk assessment prior to operating during a signal suspension.

Recommendations

New Recommendations

To CSX Transportation:

1. Develop a device or technique to eliminate the possibility of employees failing to perform critical tasks such as lining a switch, lining a derail, or ensuring cars are clear of the main track.
2. Develop and implement a safety management system that includes but is not limited to operations, training, maintenance, equipment, and medical standards.

To All Host Railroads:

3. Work in partnership with Amtrak to establish safety management criteria that support the implementation of Amtrak's safety management system.

Reiterated Recommendations

To the Federal Railroad Administration:

1. Conduct research to evaluate the causes of passenger injuries in passenger railcar derailments and overturns and evaluate potential methods for mitigating those injuries, such as installing seat belts in railcars and securing potential projectiles. (R-16-35)
2. When the research specified in Safety Recommendation R-16-35 identifies safety improvements, use the findings to develop occupant protection standards for passenger railcars that will mitigate passenger injuries likely to occur during derailments and overturns. (R-16-36)
3. Require railroads to develop a device or technique to eliminate the possibility of employees failing to perform critical tasks such as lining a switch, lining a derail, or ensuring cars are in the clear. (R-18-10)
4. Enact Title 49 *Code of Federal Regulations* Part 270, System Safety Program, without further delay. (R-17-17)

To Amtrak:

5. Work collaboratively with all host railroads and states that own infrastructure over which you operate in an effort to develop a comprehensive safety management system program that meets or exceeds the pending Federal Railroad Administration regulation, Title 49 *Code of Federal Regulations* Part 270, System Safety Program. (R-19-27)

Reclassified Recommendations

To the Federal Railroad Administration:

- 1 Issue an Emergency Order directing railroads to require that when signal suspensions are in effect and a switch has been reported relined for a main track, the next train or locomotive to pass the location must approach the switch location at restricted speed. After the switch position is verified, the train crew must report to the dispatcher that the switch is correctly lined for the main track before trains are permitted to operate at maximum-authorized speed. (R-18-05) (Urgent)

Safety Recommendation R-18-05 is classified, *Closed—Unacceptable Action*.

2. Require railroads to develop a device or technique to eliminate the possibility of employees failing to perform critical tasks such as lining a switch, lining a derail, or ensuring cars are in the clear. (R-18-10)

Safety Recommendation R-18-10 is classified, *Open—Unacceptable Response*.