

NATIONAL TRANSPORTATION SAFETY BOARD
Public Meeting of February 12, 2013
(Information subject to editing)

Railroad Accident Report:
Head-on Collision between Two Canadian National Freight Trains
Two Harbors, Minnesota
September 30, 2010

This is a synopsis from the Safety Board's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. Safety Board 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.

EXECUTIVE SUMMARY

On September 30, 2010, about 4:05 p.m., central daylight time, a southbound Canadian National Railway Company freight train collided head on with a northbound Canadian National Railway Company freight train near Two Harbors, Minnesota. The collision occurred near milepost 13.5 on Canadian National Railway Company's Iron Range Subdivision. The trains were operating in nonsignaled territory. The northbound train had 118 empty iron ore railcars and had authority to operate on the single main track. The southbound train had 116 railcars loaded with iron ore and did not have authority to operate on the single main track. The crew of the southbound train entered the main track after failing to properly execute an after-arrival track authority. A total of three locomotives and 14 railcars derailed. All five crewmembers on the two trains were injured and transported to hospitals. Four crewmembers were treated and released; one crewmember remained hospitalized for further treatment. Canadian National Railway Company estimated damages at \$8.1 million. The weather was clear and the temperature was 72°F.

The National Transportation Safety Board determines that the probable cause of the accident was the southbound train crew's error in departing the Highland siding before the northbound train had passed. Contributing to the accident was the Canadian National Railway's use of after-arrival track authorities in nonsignaled territory, a procedure that is vulnerable to human error and lacks inherent safety redundancies ensuring consistent safe operation. Also contributing to the accident was crew fatigue and inadequate crew resource management.

This report discusses the following safety issues:

- use of after-arrival track authorities for train movement on nonsignaled tracks
- prohibited use of portable electronic devices
- fatigue

- crew resource management
- management and regulatory oversight

CONCLUSIONS

1. The mechanical condition of the trains, the weather, drug or alcohol impairments, and the actions of the northbound train crew were not factors in this accident.
2. The use of after-arrival track authorities in nonsignaled territory presents unacceptable and unnecessary safety risks to railroad operational safety, because the procedure is vulnerable to human error and lacks inherent safety redundancies to ensure consistent, safe operation.
3. In the absence of a positive train control system, discontinuing the use of after-arrival track authorities in nonsignaled territory will mitigate future accidents involving authority overruns.
4. Fatigue-induced performance errors contributed to the accident.
5. The use of cell phones by crewmembers on the southbound train and by the engineer on the northbound train was a distraction to the safe operation of both trains and an indication of a clear disregard for Canadian National Railway rules and Federal Railroad Administration regulations.
6. Additional measures to prevent unauthorized portable electronic device use by train crewmembers is necessary because of the continuing use of these devices by some railroad crewmembers, and the resulting risks to safety caused by distraction.
7. Electronic signal detection technologies in locomotive cabs would enhance safety by deterring inappropriate portable electronic device use without affecting crewmember privacy.
8. Handheld cell phone-signal detectors can serve as an effective tool for personnel performing inspections and tests to deter the unauthorized use of portable electronic devices by railroad personnel.
9. The southbound train crew displayed poor coordination of activities and inadequate communication, which are indicative of poor crew resource management.
10. Had the crewmembers on the southbound train received training in, and practiced the principles of, crew resource management, they may have demonstrated better coordination and communication.
11. Given Canadian National Railway's limited management oversight of track authorities and particularly the infrequent test observations of portable electronic device use, Canadian

National Railway's program was ineffective in ensuring compliance with these operating rules.

12. Canadian National Railway's oversight of crew portable electronic device use can be improved by equipping managers with cell phone-signal detection technology.
13. A nonpunitive peer audit program is an important element of an effective safety management system and will provide Canadian National Railway management with the necessary data to better address operational safety issues.
14. Railroad safety on the Canadian National Railway North Division would benefit from a Federal Railroad Administration audit on Canadian National Railway's program of operational tests and inspections.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of the accident was the southbound train crew's error in departing the Highland siding before the northbound train had passed. Contributing to the accident was the Canadian National Railway's use of after-arrival track authorities in nonsignaled territory, a procedure that is vulnerable to human error and lacks inherent safety redundancies to ensure consistent, safe operation. Also contributing to the accident was crew fatigue and inadequate crew resource management.

RECOMMENDATIONS

New Recommendations

As a result of its investigation, the National Transportation Safety Board makes the following safety recommendations:

To the Federal Railroad Administration:

Identify, and require railroads to use in locomotive cabs, technology-based solutions that detect the presence of signal-emitting portable electronic devices and that inform the railroad management about the detected devices in real time. (R-13-XX)

Incorporate the use of handheld signal detection devices to aid in the enforcement of Title 49 *Code of Federal Regulations* Part 220 Subpart C. (R-13-XX)

Require railroads to implement initial and recurrent crew resource management training for train crews. (R-13-XX)

Conduct an audit of the Canadian National Railway's North Division program of operational tests and inspections to evaluate their effectiveness for promoting knowledge and compliance with rules regarding the execution of track authorities and the appropriate use of portable electronic devices. (R-13-XX)

To Canadian National Railway:

Discontinue the use of after-arrival track authorities in nonsignaled territory not equipped with positive train control. (R-13-XX)

Develop and implement specific training that will result in operating personnel acquiring and using strategies and skills based on the principles of crew resource management. (R-13-XX)

Incorporate the use of handheld signal detection devices into your operational efficiency program on the use of portable electronic devices. (R-13-XX)

Evaluate your operational testing program, and verify that the testing of track authority procedures and unauthorized use of portable electronic devices is adequate to ensure consistent, safe operation. (R-13-XX)

Work with the Brotherhood of Locomotive Engineers and Trainmen and the United Transportation Union, to develop and implement a nonpunitive peer audit program for the North Division, focused on rule compliance and operational safety. (R-13-XX)

To the Brotherhood of Locomotive Engineers and Trainmen:

Work with the Canadian National Railway and the United Transportation Union, to develop and implement a nonpunitive peer audit program for the Canadian National Railway's North Division, focused on rule compliance and operational safety. (R-13-XX)

To the United Transportation Union:

Work with the Canadian National Railway and the Brotherhood of Locomotive Engineers and Trainmen, to develop and implement a nonpunitive peer audit program for the Canadian National Railway's North Division, focused on rule compliance and operational safety. (R-13-XX)

To Canadian Pacific Railway Limited, Kansas City Southern Railway Company, and Norfolk Southern Railroad, and Union Pacific Railroad

Discontinue the use of after-arrival track authorities for train movements in nonsignaled territory not equipped with a positive train control system. (R-13-XX)

Previously Issued Safety Recommendation Reiterated in this Report

As a result of this accident investigation, the National Transportation Safety Board reiterates the following previously issued safety recommendations:

To the Federal Railroad Administration:

Prohibit the use of after-arrival track warrants for train movements in dark (non-signaled) territory not equipped with a positive train control system. (R-06-10)

Safety Recommendation R-06-10 is classified as “Open—Unacceptable Response”.

Establish an ongoing program to monitor, evaluate, report on, and continuously improve fatigue management systems implemented by operating railroads to identify, mitigate, and continuously reduce fatigue-related risks for personnel performing safety-critical tasks, with particular emphasis on biomathematical models of fatigue. (R-12-17)

Safety Recommendation R-12-17 is classified as “Open—Acceptable Response”.

To BNSF Railway:

Discontinue the use of after-arrival track warrants for train movements in dark (non-signaled) territory not equipped with a positive train control system. (R-06-12)

Safety Recommendation R-06-12 is classified as “Open—Unacceptable Response”.

To the American Short Line and Regional Railroad Association:

Encourage your members to discontinue the use of after-arrival track warrants for train movements in dark (non-signaled) territory not equipped with a positive train control system. (R-06-13)

Safety Recommendation R-06-13 is classified as “Open—Unacceptable Response”.

Previously Issued Safety Recommendation Reiterated and Reclassified in this Report

As a result of this accident investigation, the National Transportation Safety Board reiterates and reclassifies the following previously issued safety recommendations:

To the Federal Railroad Administration:

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-10-1)

Safety Recommendation R-10-1 is classified “Open—Unacceptable Response” in this report.

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. (R-10-2)

Safety Recommendation R-10-2 is classified “Open—Unacceptable Response” in this report.