



National Transportation Safety Board

Washington, DC 20594

Safety Recommendation

Date: March 8, 2013

In reply refer to: R-13-3 and -4

The Honorable Joseph C. Szabo
Administrator
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

We are providing the following information to urge your organization to take action on the safety recommendations issued in this letter. These recommendations address the improper use of jumper wires. The recommendations are derived from the National Transportation Safety Board's (NTSB) preliminary investigations of a collision between a National Railroad Passenger Corporation (Amtrak) train and an automobile in Madison, Illinois, on February 28, 2012, and the derailment of another Amtrak train in Niles, Michigan, on October 21, 2012, and are consistent with the evidence we found and the analysis performed to date. As a result of these investigations, the NTSB has issued four safety recommendations, two of which are addressed to the Federal Railroad Administration (FRA). Information supporting these recommendations is discussed below.

Both railroad accidents involve signal maintenance operations. The first accident occurred on February 28, 2012, about 11:57 a.m. central standard time, when southbound Amtrak train 301-28 collided with an automobile, which was eastbound on Bissell Avenue near Madison, Illinois. The collision occurred at a highway-rail grade crossing [U.S. Department of Transportation (DOT) no. 294473P] where the Union Pacific (UP) Railroad's Springfield Subdivision double main line and Bissell Avenue cross. At the time of the accident, two UP signal employees were working on the grade crossing warning system. The Amtrak train was equipped with a forward-facing video camera that recorded (1) the gate arms were in the upright position, and (2) the grade crossing warning lights were deactivated as the train traveled through the highway-rail grade crossing and struck the automobile. The automobile driver was fatally injured as a result of the collision. The train, which was en route from Chicago, Illinois, to St. Louis, Missouri, was traveling at 39 mph at the time of impact. The train did not derail, and there were no injuries to either the train crewmembers or the passengers.

One element that the NTSB is focusing on in this accident investigation is the procedure used to temporarily remove the highway-rail grade crossing warning system from service for the purposes of testing, inspection, and maintenance. The warning system was removed from service and did not activate as the train approached the crossing. The use of jumper wires is being investigated as a possible explanation for the warning system not activating.

The second accident involved the derailment of Amtrak train 350-21 at Niles, Michigan, on October 21, 2012, about 10:10 a.m. eastern daylight time (EDT).¹ The eastbound train entered a track in Niles Yard from the main track through a reversed power-operated switch at Control Point (CP) 190, while traveling 61 mph. The train derailed about 254 feet beyond the CP 190 power-operated switch No. 2 and traveled about 1,086 feet before stopping on the yard track. The four cars and two locomotives derailed upright and in line with the track. On board the train were 165 passengers and 4 crewmembers. Emergency responders reported that 14 persons were injured, 8 of whom were transported to area hospitals. None of the injuries was reported to be life threatening. Video- and event-recorder data show that the train was proceeding on a clear signal and that the power-operated switch was aligned in the reverse position (that is, toward the Niles yard). An engineer-induced emergency braking application was recorded at 10:09:51 a.m. CP 190 power-operated switch No. 2 was part of a No. 10-turnout² that was limited to 15 mph for movement toward the yard. The yard track beyond this turnout was limited to 5 mph. Damage was estimated at \$400,000.

Preliminary information obtained by NTSB investigators indicated that an Amtrak signal employee was performing troubleshooting activities with jumper wires inside the signal bungalow just prior to the derailment. The signal employee was applying a jumper wire to energize the circuit that verified the position of the No. 2 switch. This circumvented the signal system's ability to verify that the power-operated switch was aligned and locked in the correct position for the displayed signal aspect. The signal employee also did not protect against approaching train movements before applying the jumper wires.

The FRA has regulatory requirements in place that address the problems identified in these two accidents. FRA regulations at Title 49 *Code of Federal Regulations* (CFR) section 234.209 prohibit interference with the normal functioning of any system without first taking measures to provide for the safety of highway traffic. Regulations at 49 CFR 236.4 prohibit interference with the normal functioning of any device in testing without first taking measures to provide for the safety of train operations. Over time, the railroad industry has developed a number of best practices based on these regulatory requirements.

In 2002, after a series of accidents involving maintenance operations that disabled safety circuits of grade crossing warning systems, the FRA issued a safety advisory³ that addressed the importance of clear, precise, unambiguous safety procedures to ensure the safety of highway-rail grade crossing warning systems or wayside signal systems that are temporarily removed from

¹ In the discussion of the Niles, Michigan, accident, all times are listed as EDT.

² A *turnout* diverts trains from one track to another. The turnout number indicates the sharpness of the curve of the divergent track. A higher turnout number indicates a shallower curve.

³ Federal Railroad Administration, "Notice of Safety Advisory 2002-01," *Federal Register* vol. 67, no. 13, (January 23, 2002), pp. 3258-3260.

service for purposes of testing, inspection, or repair. The advisory outlined a number of industry best practices and urged railroads to adopt them in order to mitigate the risks posed by disabling the safety circuits in grade crossing warning and railroad signal systems. One section of the FRA's 2002 safety advisory specifically addressed the use of jumper wires and stated that the FRA had found the most effective safety procedures require documentation regarding the number, location, and circuitry designation where jumper wires are used. In addition, the safety advisory cited the importance of thorough job briefings, testing prior to returning the warning system to service, and a requirement for keeping records of such tests. Finally, the safety advisory strongly recommended that each railroad provide regular periodic training to all affected employees to ensure their understanding of instructions for the proper temporary deactivation of grade crossing warning or wayside signal systems, including the proper use of jumper wires. Given the circumstances of these two recent accidents—Madison and Niles—the NTSB believes that informing the industry about these two accidents could help prevent similar accidents from occurring. Accordingly, the NTSB is asking railroads to ensure their jumper wire procedures comply with the best industry practices outlined in the FRA's 2002 safety advisory and also take into consideration other best practices that FRA has identified since 2002, such as the use of various technological solutions.

Therefore, the National Transportation Safety Board makes the following safety recommendations to the Federal Railroad Administration:

R-13-3

Reissue the best practices outlined in your Safety Advisory 2002-01, as part of an updated safety advisory that: (1) advises all railroads of the circumstances of the Madison, Illinois and Niles, Michigan accidents involving signal system maintenance procedures, and (2) highlights the importance of adhering to the specified industry best practices regarding the use of jumper wires.

R-13-4

Audit all railroad procedures and maintenance oversight programs regarding the use of jumper wires to ensure they incorporate the current best industry practices outlined in the revised Safety Advisory recommended in Safety Recommendation R-13-3 and ensure that railroad procedures comply with Title 49 *Code of Federal Regulations* (CFR) sections 236.4 and 234.209.

The NTSB also issued safety recommendations to the Federal Transit Administration.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in these recommendations.

The NTSB is vitally interested in these recommendations because they are 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 them, and a timeline

for doing so. When replying, please refer to the safety recommendations by number. We encourage you to submit your response electronically to correspondence@ntsb.gov.

By: [Original Signed]
Deborah A.P. Hersman
Chairman