



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: Sep 24, 2001

In reply refer to: R-01-18 and -19

Mr. Richard K. Davidson
Chairman, President, and Chief Executive Officer
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The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, 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 Union Pacific Railroad's (UP's) signal maintenance procedures and postaccident site securement procedures for highway-rail grade crossing accidents. The recommendations are derived from the Safety Board's investigation of the collision of National Railroad Passenger Corporation (Amtrak) train 304-26 with a highway vehicle at a highway-rail grade crossing in McLean, Illinois, on September 26, 1999, and are consistent with the evidence we found and the analysis we performed.¹ As a result of this investigation, the Safety Board has issued four safety recommendations, two of which are addressed to the UP. Information supporting the 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.

On September 26, 1999, about 5:08 p.m. (central daylight time), northbound Amtrak train 304-26, which was en route from St. Louis, Missouri, to Chicago, Illinois, collided with an automobile, which was westbound on U.S. Route 136. The collision occurred where the UP's St. Louis Division main line and U.S. Route 136 cross near McLean, Illinois. The automobile driver and passenger were killed as a result of the collision. Amtrak train 304-26 did not derail, and no injuries to the train crewmembers or passengers were reported. Neither the flashing lights nor the gates for the grade crossing activated to warn the automobile driver of the approaching train. A UP signal maintainer had worked on the grade crossing warning devices earlier that day; he had finished his work and left the McLean grade crossing area about 4:30 p.m.

¹ For additional information, see forthcoming Railroad Accident Report NTSB/RAR-01/03: *Collision of Amtrak Train 304-26 with a Highway Vehicle at a Highway-Rail Grade Crossing, McLean, Illinois, September 26, 1999* (Washington, DC: National Transportation Safety Board, 2001).

The National Transportation Safety Board determined that the probable cause of the accident was the failure of the signal maintainer to remove a jumper wire from the grade crossing control relay and, as required by the Union Pacific Railroad's written procedures, to verify the operational status of the grade crossing equipment after he had completed the maintenance work.

During its investigation, the Safety Board found that, in addition to leaving the jumper wire on the crossing control relay on the day of the accident, the UP signal maintainer did not perform his work near the U.S. Route 136 grade crossing in accordance with UP rules. First, in a deviation from UP rules, the signal maintainer failed to obtain authority from the dispatcher while he worked on the track connection to provide protection against train movements for himself and for highway vehicles crossing the tracks while the crossing gates and lights were disabled by the false energizing of the crossing control relay.

The signal maintainer further deviated from the railroad's rules by not performing operational tests, as required by the UP, on the grade crossing warning devices at the U.S. Route 136 crossing after he recalibrated the grade crossing predictor. Data from the grade crossing event recorder and the video monitoring system confirm that no operational tests were conducted on the crossing warning system after the recalibration.

Had the signal maintainer performed these operational tests of the grade crossing equipment after the recalibration, he would have detected the failure of the warning devices to activate. Thus alerted, he would have rectified the situation by removing the jumper wire from the crossing control relay, which would have left the grade crossing warning devices capable of activating when a train was detected. Consequently, the Safety Board concluded that because the signal maintainer failed to fulfill the UP's requirement to conduct operational tests on the grade crossing warning devices after he performed a recalibration of the grade crossing predictor, he did not realize that the jumper wire was still attached to the crossing control relay.

Employee training records indicate that the signal maintainer was qualified under roadway worker protection requirements, signal test and maintenance procedures, and on-track safety requirements. UP records indicate that the signal maintainer had attended training in these subjects within the year before the accident. Nevertheless, despite the signal maintainer's training and qualifications, he did not follow UP company safety procedures concerning post-calibration operational testing, with ultimately disastrous results.

The Safety Board attempted to determine why the signal maintainer, who had worked in railroad signal departments for more than 30 years, who was qualified and trained, and who had a relatively good disciplinary record, made the errors he made on the day of the accident. Unfortunately, because the signal maintainer would not give Safety Board investigators his account of the events that led to the accident or information about his activities in the days preceding the accident, the Safety Board had insufficient information to determine possible reasons for the signal maintainer's errors. The Safety Board also could not establish whether the signal maintainer might have been under the influence of drugs or alcohol when he carried out his work on the day of the accident, because no postaccident drug or alcohol testing was conducted on the signal maintainer.

The Safety Board appreciates that signal personnel are required at times to conduct their work at grade crossings under heavy traffic without the aid of flagmen to provide highway traffic

control. Although undesirable, these situations often require signal personnel to use jumper wires to totally or partially disable the grade crossing warning devices. The Safety Board considers, however, that means are available that would make the use of jumper wires in such situations safer and more regimented.

Some railroads provide their signal personnel with maintenance vehicles equipped with specialized electronic rack units that are designed to notify signal personnel when a jumper wire is missing from the rack with both an audible warning alarm and a visual light signal. These warning systems provide a double-checking mechanism that helps the railroad safeguard against its employees leaving jumper wires in unsafe locations.

Such warning equipment provides an automatic and reliable means of ensuring that signal employees keep track of the jumper wires they use on the job, thus offsetting human errors caused by distraction, habit, or carelessness. By using such equipment, the railroad can greatly reduce the possibility of a jumper wire being left in an unsafe location, as occurred in the McLean accident. The Safety Board concluded that had the UP provided its signal personnel with automatic warning equipment that alerted them when they failed to retrieve all jumper wires before leaving a work location, the signal maintainer would not have left the U.S. Route 136 grade crossing without removing the jumper wire that was still attached to the crossing control relay. Therefore, the Safety Board believes that the UP should provide its signal maintenance personnel with dedicated jumper wire warning systems or other equipment that will automatically alert them if they attempt to leave a work site without retrieving all jumper wires they have used at that location.

After being notified of the collision, the UP had the signal maintainer and the signal technician for this location contacted and called to the accident scene. When he arrived at the scene, the signal maintainer, who had earlier that day recalibrated the grade crossing predictor, entered the signal case for the U.S. Route 136 grade crossing by himself, while the signal technician went to assess damages at the crossing. Some time later, the signal technician joined the signal maintainer in the signal case. Subsequently, State police, at the request of the deputy coroner, asked the two railroad employees to exit the signal case until the accident reconstructionist (the deputy coroner) gave them authorization to begin testing the equipment. No one reported finding a jumper wire attached to the crossing control relay after the signal maintainer left the signal case, despite the fact that the event recorder and simulations evidence strongly indicated that a jumper wire had been on the crossing control relay when the accident occurred.

Because the work done on the signals earlier in the accident day had a direct bearing on the accident, the fact that the signal maintainer was the first person to enter the signal case and had unsupervised control of the case for some time could have created a perception that the signal evidence was not being preserved as professionally as possible. The Safety Board is concerned that such instances could be detrimental to an effective investigative process. Consequently, the Safety Board concluded that the UP's failure to secure the signal case immediately after the accident compromised the integrity of the accident investigation.

The UP manager of signal maintenance who supervised the signal personnel dispatched to the McLean accident scene has stated that, based on the lessons he learned in the aftermath of

this accident, he now sends a signal maintainer from a neighboring territory to respond to any reported grade crossing accident. The Safety Board finds this a prudent step but considers that the UP can and should make a greater effort to guarantee the integrity of the postaccident procedures necessary to all grade crossing accident investigations. Therefore, the Safety Board believes that the UP should establish procedures to immediately secure the signal case associated with any grade crossing accident until an appropriate, authorized UP or government official is on the scene to supervise entry to the signal case.

Therefore, the National Transportation Safety Board makes the following safety recommendations to the Union Pacific Railroad:

Provide your signal maintenance personnel with dedicated jumper wire warning systems or other equipment that will automatically alert them if they attempt to leave a work site without retrieving all jumper wires they have used at that location. (R-01-18)

Establish procedures to immediately secure the signal case associated with any grade crossing accident until an appropriate, authorized Union Pacific Railroad or government official is on the scene to supervise entry to the signal case. (R-01-19)

The Safety Board also issued safety recommendations to the Federal Railroad Administration and the Brotherhood of Railroad Signalmen. In your response to the recommendations in this letter, please refer to Safety Recommendations R-01-18 and -19. If you need additional information, you may call (202) 314-6607.

Acting Chairman CARMODY and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By: Carol J. Carmody
Acting Chairman