



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: APR 10 2008

In reply refer to: R-08-05 through -07

Honorable Joseph H. Boardman
Administrator
Federal Railroad Administration
1120 Vermont Avenue, S.W.
Washington, D.C. 20590

On Tuesday, January 9, 2007, at 1:38 p.m.,¹ southbound Massachusetts Bay Transportation Authority (MBTA) passenger train 322 operated by Massachusetts Bay Commuter Railroad (MBCR) struck a track maintenance vehicle that was on the track near Woburn, Massachusetts. Passenger train 322 consisted of six passenger cars, including a lead control car, and a locomotive pushing from the rear. The track maintenance vehicle was thrown forward about 210 feet; the train did not derail. Of the six maintenance-of-way employees (work crew) working on or near the track maintenance vehicle, two were killed, and two were seriously injured. Emergency responders treated and released 10 passengers at the accident scene. As a result of the accident, 160 feet of rail, 80 crossties, and 100 tons of ballast had to be replaced. The cost, including labor, was \$15,841. The accident damaged the lead control car and undercarriage of the train. Repairing the train cost an estimated \$450,000. The track maintenance vehicle was destroyed; replacing it cost \$95,000. Total estimated property damage was \$560,841.²

The National Transportation Safety Board determines that the probable cause of the January 9, 2007, collision of train 322 with a track maintenance vehicle near Woburn, Massachusetts, was the failure of the train dispatcher to maintain blocking that provided signal protection for the track segment occupied by the maintenance-of-way work crew, and the failure of the work crew to apply a shunting device that would have provided redundant signal protection for their track segment. Contributing to the accident was Massachusetts Bay Commuter Railroad's failure to ensure that maintenance-of-way work crews applied shunting devices as required.

¹ All times are eastern standard time.

² For additional information, see <<http://www.nts.gov/publictn/2007/RAB0801.pdf>>. National Transportation Safety Board, *Collision of Massachusetts Bay Transportation Authority Train 322 and Track Maintenance Equipment near Woburn, Massachusetts, January 9, 2007*, Railroad Accident Report NTSB RAR-08/01 (Washington, DC: NTSB, 2008).

Track Maintenance Activities and Train Dispatching Procedures

On the day of the accident, the track segment had been removed from service and the track maintenance crew had been given exclusive track occupancy; so their expectation was that no train would be permitted on the track while they were working on it.

The engineer of the accident train had a clear signal indication and did not have any knowledge that a track maintenance crew would be occupying the same track. After exiting a curve at approximately 62 mph, little time (about 15 seconds) was available before the train reached the work area. The engineer realized that the work crew was on his track and initiated emergency braking. Train speed decreased to approximately 44 mph at the time of the collision.

A shunting device electrically prevents the signals from displaying clear indications to approaching trains. The Safety Board concludes that the track maintenance crew had not applied a shunting device; therefore, additional signal protection did not exist for the track segment they occupied, and the dispatcher's screen did not indicate the track segment was occupied.

MBCR rules required the track foreman to have a shunting device at each end of the work area every time a track was taken out of service for maintenance. However, interviews with track maintenance employees, including those not involved in the accident, confirmed that it was common practice to use shunting devices only for big jobs and that replacing ties, as the track crew in the accident had been doing, was considered to be a small job. The track crew had reserved the track segment from 9:45 a.m. to 3:00 p.m. and was clearly engaged in a significant amount of work on the day of the accident. The Safety Board concludes that MBCR maintenance-of-way work crews routinely reduced safety by not using shunting devices when performing jobs that required the track to be out of service.

The MBCR had many opportunities to be aware that the requirement to use shunting devices was commonly disregarded. For example, track supervisors visiting work sites could have seen that a shunting device was not used as required. Transportation supervisors on passing trains could have observed that shunting devices were not in place. Dispatching supervisors could have noted the absence of a magenta indication on the dispatching screens. Finally, the MBCR's program of tests and observations should have provided a safety net to ensure that compliance with the rules was frequently examined. The Safety Board concludes that the MBCR's management failed to ensure that maintenance-of-way work crews were using shunting devices as required.

The primary method used by railroads to protect roadway workers with exclusive track occupancy is by train dispatcher blocking and unblocking of track segments. The layers of redundant steps required for the dispatcher to block and unblock track segments vary from railroad to railroad depending on their procedures and the design of their dispatching system. Although the MBCR has modified its dispatching methods since this accident, the potential exists on other railroads for a dispatcher to incorrectly apply or remove the protection. Therefore, the Safety Board recommends that the FRA advise railroads of the need to examine their train dispatching systems and procedures to ensure that appropriate safety redundancies are in place for establishing protection and preventing undesired removal of protection for roadway workers receiving track occupancy authority.

The Safety Board is aware that shunting by track maintenance work crews on main track is not a common practice in the railroad industry. This may be due, in large part, to the absence of a Federal requirement for shunting to provide maintenance-of-way work crew protection. Unless a shunting device is used by the work crew, the train dispatcher provides the only signal protection in controlled territory. As this accident demonstrates, the dispatching system is not immune to human error, and electrically shunting the rails is therefore an important safety redundancy. The Safety Board concludes that maintenance-of-way work crews on all railroads who depend on the train dispatcher for signal protection need redundant protection to restrict train movements into work areas. Therefore, the Safety Board recommends that the FRA require redundant signal protection, such as shunting, for maintenance-of-way work crews who depend on the train dispatcher to provide signal protection.

Alcohol/Drug Use by Maintenance-of-Way Employees

The fatally injured track foreman tested positive for marijuana. He had likely used marijuana within 3 hours of his death and possibly much more recently. The Safety Board concludes that the foreman's performance would likely have been measurably impaired at the time of the accident by his recent use of marijuana.

The positive drug test result for the track foreman is not an isolated incident among MBCR maintenance-of-way employees. The Safety Compliance Agreement, an agreement adopted in 2007 by the FRA, the MBTA, and the MBCR, discusses four MBCR accidents within a 3-year period (December 2003–January 2007) involving maintenance-of-way employees. Following these accidents, seven maintenance-of-way employees were tested for alcohol and/or drugs. Four of the employees were killed and therefore were tested under Federal authority. Two of the four fatalities tested positive and are included in the FRA postaccident test data described later in this letter. The three surviving employees were tested at company request; consequently, they are not included in the FRA postaccident test data. Two of the survivors tested positive, and the third survivor submitted a diluted specimen that may have masked a positive.

The MBCR's percentage of positive test results involving maintenance-of-way employees in postaccident alcohol and drug testing is a cause for concern. The FRA addressed this problem in the Safety Compliance Agreement by prescribing multiple actions, including having the MBCR make a good faith effort to work with the applicable parties to institute a company random alcohol and drug testing program of maintenance-of-way employees.

The Safety Board reviewed industry-wide postaccident test data for accidents involving maintenance-of-way employee fatalities. Postaccident test data provided to the Board by the FRA show that over the 10-year period ending January 9, 2007 (the date of this accident), the postaccident testing of 26 maintenance-of-way fatalities resulted in 5 positive test results, a 19.23 percent positive rate. The positive rate for maintenance-of-way employees is in marked contrast to the postaccident test results of covered employees. During the same 10-year period, FRA postaccident test data for accidents involving 122 fatally injured covered employees show 8 positive test results, a 6.56 percent positive rate. Covered employees are subject to random testing for alcohol and drugs at any time and at any place while they are on duty. The Safety Board concludes that postaccident test data for fatally injured railroad employees indicate greater

alcohol and drug use among maintenance-of-way employees than among railroad employees subject to random and postaccident testing requirements.

Congress has recognized the deterrent effect of random testing in the United States Armed Forces. In passing the Omnibus Transportation Employee Testing Act of 1991, Public Law No. 102-143, Congress specifically noted that

The testing of uniformed personnel of the Armed Forces has shown that the most effective deterrent to abuse of alcohol and use of illegal drugs is increased testing, especially random testing.

The FRA has also recognized the deterrent effect of random testing in the railroad industry. The FRA has stated³ the following:

The deterrent effect of random drug testing, which was implemented in 1988–1989, most certainly influenced the dramatic reduction in post-accident positives from 41 in 1988 to only 17 in 1990.

The FRA data from postaccident alcohol and drug testing indicate that maintenance-of-way employees are about three times more likely to have positive test results than are covered employees (19.23 percent vs. 6.56 percent). This difference is attributable to the deterrent value of the FRA's random testing program to which covered employees are subject but maintenance-of-way employees are not. The Safety Board concludes that the FRA's random alcohol and drug testing program has been a deterrent to alcohol and drug use by covered employees, as evidenced by their significantly lower positive rate in postaccident tests than maintenance-of-way employees who are not subject to random testing. Limiting the applicability of alcohol and drug testing to only "hours-of-service" employees restricts the potential effectiveness of the FRA rule to control alcohol and drug use. All employees and agents in safety-sensitive positions should be subject to all the provisions of 49 *Code of Federal Regulations* (CFR) Part 219. Therefore, the Safety Board recommends that the FRA revise the definition of "covered employee" under 49 CFR Part 219 for purposes of Congressionally mandated alcohol and controlled substances testing programs to encompass all employees and agents performing safety-sensitive functions, as described in 49 CFR 209.301 and 209.303.

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

Advise railroads of the need to examine their train dispatching systems and procedures to ensure that appropriate safety redundancies are in place for establishing protection and preventing undesired removal of protection for roadway workers receiving track occupancy authority. (R-08-05)

Require redundant signal protection, such as shunting, for maintenance-of-way work crews who depend on the train dispatcher to provide signal protection. (R-08-06)

³ 66 *Federal Register* 64004.

Revise the definition of “covered employee” under 49 *Code of Federal Regulations* Part 219 for purposes of Congressionally mandated alcohol and controlled substances testing programs to encompass all employees and agents performing safety-sensitive functions, as described in 49 *Code of Federal Regulations* 209.301 and 209.303. (R-08-07)

The Safety Board also issued a safety recommendation to the Brotherhood of Maintenance of Way Employees Division. In your response to the recommendations in this letter, please refer to Safety Recommendations R-08-05 through -07. If you need additional information, you may call (202) 314-6177.

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN, HIGGINS, and CHEALANDER concurred in these recommendations.

A handwritten signature in black ink, appearing to read 'Mark V. Rosenker', with a stylized, flowing script.

By: Mark V. Rosenker
Chairman