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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

ST-1

Date: NOV 14 1996

In Reply Refer To: R-96-52

Mr. William E. Loftus
President
American Short Line Railroad Association
1120 G Street, N.W.
Suite 520
Washington, D.C. 20005-3889

On October 25, 1995, at 7:10 a.m., the Northeast Illinois Regional Commuter Railroad Corporation (d/b/a Metropolitan Rail) express commuter train 624 struck the rear left side of a stopped Transportation Joint Agreement School District 47/155 school bus at a railroad/highway grade crossing in Fox River Grove, Illinois.[1] After the school bus crossed the railroad tracks and stopped for a red traffic signal, its rear extended about 3 feet into the path of the train. Of the 35 school bus passengers, 7, 24, and 4 passengers sustained fatal, serious to minor, and no injuries, respectively; the busdriver received minor injuries. The 120 passengers and 3 crewmembers aboard the commuter train were uninjured.

The National Transportation Safety Board investigation determined that on October 11, 1995, the Union Pacific Railroad Company (UP) reset the thumb wheel[2] at the railroad/highway crossing in question from 30 to 25 seconds but did not notify the Illinois Department of Transportation (IDOT) of the change. IDOT and the railroad exchanged various documents before the accident that included information about the warning times of the railroad signal system. After the accident, IDOT reviewed the documents and thought that they had been given 30 and 25 seconds of warning time, respectively, before and after October 11, 1995. During this review, the most misunderstood term was "warning time." IDOT personnel had concluded from the construction prints, numerous letters and memos, and thumb wheel setting, that a minimum warning time of either 25 or 30 seconds was provided between the time the crossing warning devices were activated and a train reached the crossing.

[1]For more information, see Highway/Railroad Accident Report—*Collision of Northeast Illinois Regional Commuter Railroad Corporation (METRA) Train and Transportation Joint Agreement School District 47/155 School Bus at Railroad/Highway Grade Crossing in Fox River Grove, Illinois, on October 25, 1995* (NTSB/HAR-96/02).

[2]Warning time switch for a crossing signal.

The warning time provided by the railroad signal system does not always equate to the thumb wheel setting (25 seconds at the time of the accident). Postaccident testing found that the warning time may have been less than 25 seconds, although never less than 20 seconds, as required. Although IDOT acknowledged that it understood the railroad terminology for "preempt" and "interconnect," it did not understand that additional time must be built into the thumb wheel setting to ensure the minimum warning time because of delay times in the circuitry. IDOT officials, according to testimony, did not understand that the railroad was only providing a 20-second minimum warning time through the thumb wheel setting.

Before the accident, State and railroad signal technicians had discussed the signal systems, and a number of design reviews of the accident grade crossing had also been conducted. IDOT representatives had responded to the intersection on several occasions to check for short green indications. However, until the day of the accident, they had checked the operating program of the traffic signal system and not recognized that Algonquin Road did not receive a signal in time for traffic to clear the railroad tracks. IDOT did not understand the timing. According to the IDOT engineering technician who programmed the highway signal system conforming to his experiences of 20 to 30 seconds, he never used any written information on the warning time from the railroad. Therefore, the Safety Board concludes that IDOT had programmed its highway signal system without applying the minimum warning time information from the railroad.

When the UP reset the thumb wheel on October 11, 1995, it did not notify IDOT of the change. The Safety Board is unable to determine whether IDOT would have reacted had they been notified. Even after the accident, IDOT considered that the 25-second thumb wheel setting meant 25 seconds of warning time. Also, it had not modified the programming previously, even though the 25-second warning time was referenced before the change in the thumb wheel setting.

IDOT had opportunities to identify the short green indication for northbound Algonquin Road during 70-mph train operations and, as a result, could have modified the highway traffic signal system or requested more time from the railroad to ensure a sufficient interval for traffic to clear the grade crossing. However, the communication process about the interconnected signal systems was not effective between the State and the railroad. Had an effective communication system existed between IDOT and the UP about the interconnected signal systems, IDOT might have understood that the railroad had provided through the thumb wheel setting only a minimum of 20 seconds of warning time before the arrival of a train at the grade crossing.

In three previous Safety Board investigations, ineffective communications between highway departments and the railroads had caused or contributed to grade crossing accidents. First, in a March 1993 Fort Lauderdale, Florida, accident,[3] highway engineers designed a work zone causing traffic to congest at the railroad/highway grade crossing. The Safety Board found that the highway engineers had not "adequately considered either the traffic congestion or the

[3]Highway Accident Report--*Gasoline Tank Truck/Amtrak Train Collision and Fire in Fort Lauderdale, Florida, March 17, 1993* (NTSB/HAR-94/01).

resulting obstruction of the railroad/highway grade crossing." Then, in the November 1993 Intercession City, Florida, accident[4] involving a low clearance, overdimension, overweight vehicle, the Safety Board found that the Florida Department of Transportation did not ensure that the railroad had been notified of the movement of this vehicle over its grade crossing. Finally, in the May 1995 collision at a grade crossing near Sycamore, South Carolina,[5] the Safety Board reported:

> Recent interviews and previous accident investigations conducted by the Safety Board have revealed that the degree of communication and cooperation between railroads and public entities regarding grade crossing activities varies widely. Railroad and public officials tend to communicate more on activities that involve funding of active crossings or the installation and maintenance of active warning devices, or that are likely to generate public complaints. The same level of communication does not exist when it comes to other crossing maintenance activities, particularly as they relate to passive crossings. CSX Transportation (CSXT), which operates more than 20,000 miles of track, performs crossing profile maintenance to ensure track vertical and horizontal alignment and adequate drainage, while State, local, and sometimes private entities are responsible for maintaining the alignment of the crossing approaches. When crossing maintenance is performed, the CSXT does not always advise respective entities of these activities. By the same token, in some cases, local entities perform work to realign crossing approaches without informing the railroads. Thus, the Safety Board concludes that railroads and public entities do not routinely communicate with each other on grade crossing maintenance activities.

Misunderstandings about grade crossing systems can be manifested through differences in terminology, construction and maintenance designs and practices, and inspection and operation methods. Although many efforts have been made to address grade crossing safety, no single coordinated program has been available to ensure effective communication on all aspects of grade crossing safety between transportation modes. The Safety Board concludes that, had a coordinated program to ensure effective communication between transportation modes about all aspects of grade crossing safety been in operation, the ineffective communication between IDOT and the railroad might never have occurred.

Based on the foregoing, the National Transportation Safety Board makes the following safety recommendation to the American Short Line Railroad Association:

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[4]Highway Accident Report--*Collision of Amtrak Train No. 88 with Rountree Transport and Rigging, Inc., Vehicle on CSX Transportation, Inc., Railroad near Intercession City, Florida, on November 30, 1993* (NTSB/HAR-95/01).

[5]Highway Accident Report--*Highway/Rail Grade Crossing Collision near Sycamore, South Carolina, May 2, 1995* (NTSB/HAR-96/01).

Advise your members of the circumstances of this accident and, in cooperation with the U.S. Department of Transportation, notify railroads and public entities about the importance of exchanging information regarding railroad/highway grade crossings. (R-96-52)

The National Transportation Safety Board is also making recommendations to the U.S. Secretary of Transportation, the Federal Highway Administration, the Federal Railroad Administration, the National Highway Traffic Safety Administration, the State of Illinois, the Illinois Department of Transportation, the Transportation Joint Agreement School District 47/155, the National Association of State Directors of Pupil Transportation Services, the American Association of State Highway and Transportation Officials, the National Association of County Engineers, the American Public Works Association, the Institute of Transportation Engineers, the Association of American Railroads, the American Public Transit Association, and Operation Lifesaver, Inc. (The Safety Board issued urgent action recommendations following this accident to the Federal Highway Administration, the Federal Railroad Administration, and the State Directors of Transportation.)

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation R-96-52. If you have any questions, you may call (202) 314-6448.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By: Jim Hall
Chairman