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R-649A

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C. 20594

Safety Recommendation



Date: November 23, 1994

In Reply Refer To: R-94-16

Mr. Edwin L. Harper
President and Chief Executive Officer
Association of American Railroads
50 F Street, N.W.
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On November 11, 1993, about 12:24 a.m. Pacific Standard Time, a Burlington Northern (BN) freight train collided head on with a Union Pacific (UP) freight train at BN milepost 102.8 south of the Longview Junction South interlocking near Kelso, Washington.¹ As a result of the accident all five crewmembers from both trains were killed.

On July 13, 1994, the Federal Railroad Administration (FRA) released *Railroad Communications and Train Control*.² The report discusses positive train control (PTC) in detail. The FRA suggests using risk assessment to determine which rail corridors could benefit the most from PTC. It has committed to monitoring and providing technical support for the PTC test bed in the northwest United States. It has also indicated that it will support Amtrak's activities on the northeast corridor to upgrade signal systems for 150-mph operation and will promote and develop PTC technologies as an element of high speed rail technologies.

The Safety Board recognizes the efforts of the FRA, the AAR, and the railroad industry in developing the report, and the Board supports its essence. However, the Board remains concerned about the future of positive train separation (PTS) in the United States.

¹For more information, read Railroad Accident Report--*Head-On Collision and Derailment of Burlington Northern Freight Train 01-111-10 and Union Pacific Freight Train NPSEZ-09, Kelso, Washington, November 11, 1993* (NTSB/RAR-94/02).

²U. S. Department of Transportation, FRA. *Railroad Communications and Train Control*. Report to Congress, July 1994.

The Safety Board has long believed that PTS has advantages beyond safety that should be considered. Increase in rail line efficiency and utilization, savings in fuel use, reduced wear and tear on equipment through train pacing, and maintenance savings from eliminating pole lines and outdated signal equipment are a few of the business benefits.

The Manager for Train Control Technology for the AAR stated in his presentation on advanced train control systems to the International Association of Railway Operating Officers in 1993 that "rarely has a technology offered as broad a range of benefits to the railroad industry."

In *Railroad Communications and Train Control*, the cost of a universal PTS control system for the nation's railroads is estimated as between \$859 million and \$1.1 billion; however, safety is named as the only quantifiable benefit of PTC. The FRA alludes to the existence of business benefits from PTC but includes safety savings of only \$34.5 million per year. Clearly the benefits of a PTS control system go well beyond safety, but if safety remains the only identified benefit, PTS control systems will never be economically justified.

The safety savings of \$34.5 million per year seem vastly understated in view of the large amounts recently awarded to victims of transportation accidents in litigation suits. Any single serious passenger train accident involving fatalities and/or serious injuries would probably quickly exceed the \$34.5 million per year figure.

The FRA issued a press release with its report to Congress that stated:

To further advance positive train control, FRA, over the next 4 years, will identify high risk rail corridors on which PTC installation could be justifiable based on cost/benefit analysis. Upon a favorable finding, FRA would require installation on specific high risk corridors.

The Safety Board is concerned that without a full assessment of all of the benefits of PTS, including a more reasonable estimate of the true safety savings based on preventing litigation, there may never be a favorable finding by the FRA.

The Safety Board believes that the business benefits associated with PTS are real and need to be included in the cost benefit analysis. If safety is the only criteria for justifying PTS, then the growth of PTS will be very slow. Lack of understanding of the business benefits of PTS may be used as an excuse to label PTS control systems as too costly. The Federal Government and the railroad industry must know the true benefits of PTS control systems before they can make the proper decision regarding its application.

The Safety Board believes that the FRA and the AAR should identify and evaluate all of the potential benefits of PTS and include them in any cost benefit analysis conducted on PTS control systems. The Safety Board concludes that all potential benefits of PTS need to be identified and included in any cost benefit analysis of PTS control systems.

PTS control systems require specific information about the train speed and location to perform their functions. The control system also requires a *data link communications platform* to share the information with traffic control centers to ensure safe operation and to avoid conflicts with other trains in the vicinity. Once this information is made available to the PTS control system, it may be possible to use the information for other safety functions. For example, once a train's speed, direction, and exact location are known, it may be possible to provide information to motor vehicles waiting at grade crossings. Information could be displayed on an electronic display installed at the crossing. The display could be used to advise the motorists of such things as the presence of two trains converging at a double track crossing.

During the Rail Safety Summit sponsored by the Department of Transportation on September 30, 1994, panelists mentioned the possibility of using a PTS control system to send train movement information directly to individual vehicles. This possibility was also mentioned in the FRA's report to Congress. The ability to communicate information to individual vehicles could be incorporated in the Department of Transportation's *Intelligent Transportation System* program (formally *The Intelligent Vehicle Highway System*). The Safety Board concludes that PTS data and information may be useful in enhancing grade crossing safety.

The need for PTS goes beyond the economic benefits of accident avoidance. It is impossible to fully assess the impact of fatalities, serious injury, property damage, environmental damage, or damages awarded through litigation on railroad employees, railroad passengers, or members of the general public. As railroad traffic increases, the risk of major accidents involving passenger trains and freight trains also increases. Public sentiment demands that the railroads be safe. The risk of injuring or killing train crewmembers and passengers or members of the general public, as well as the risk of environmental damage caused by hazardous material spills, is unacceptable. Using PTS control systems is one way that the railroads can act to prevent a great number of human performance or human error accidents.

Therefore, the National Transportation Safety Board recommends that the Association of American Railroads:


In conjunction with the Federal Railroad Administration, identify and evaluate all of the potential benefits of positive train separation and include them in any cost benefit analysis conducted on positive train separation control systems. (Class II, Priority Action) (R-94-16)

Also, the Safety Board issued Safety Recommendations R-94-13, -14, and -15 to the Federal Railroad Administration, R-94-17 to the Burlington Northern Railroad, and R-94-18 to the Union Pacific Railroad.

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 vitally 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 Recommendations R-94-16 in your reply. If you need additional information, you may call (202) 382-6840.

Chairman HALL and Members LAUBER and HAMMERSCHMIDT concurred in these recommendations.


By: Jim Hall
Chairman