

Log # R-0663



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 19, 1996

In Reply Refer To: R-96-12 through -14

Honorable Jolene M. Molitoris
Administrator
Federal Railroad Administration
Washington, DC 20590

On August 3, 1994, Amtrak (National Railroad Passenger Corporation) train 49, en route from New York, New York, to Chicago, Illinois, was traveling westbound about 79 mph on Conrail (Consolidated Rail Corporation) trackage. About 3:44 a.m., the train derailed near Batavia, New York. No fatal injuries were sustained; 108 passengers and 10 crewmembers were injured.¹ The National Transportation Safety Board determines that the probable cause of the derailment was the fact that Federal and industry guidelines do not currently address flattened rail head conditions, due to an insufficient understanding of the risk that flattened rail poses to train operations.

The flattened rail head found in this accident is not unique to Conrail. The Association of American Railroads (AAR) examined rail in 1994 from the Chicago & North Western (CNW) and from the Canadian National (CN) railroads that exhibited similar physical and chemical properties to the flattened rail head from the Batavia derailment. These rails were manufactured in the 1970s; the CNW rail was an "A" rail.² (A CNW and CN review of other rails suggested "A" rails were more likely to have this flattened head condition.) Rolling load tests on the CN rail, performed by the AAR, disclosed that after 2 million cycles of impact simulation, no internal fatigue defects developed. The AAR concluded that these flattened rail conditions tended not to be structurally destructive. As a remedy for the rail condition, the CNW placed a speed

¹ For further information, read Railroad Accident Report—*Derailed Amtrak Train 49 on Conrail Trackage near Batavia, New York, August 3, 1994* (NTSB/RAR-96/02).

² "A" rails are rolled from the top portions of ingots cast from the open hearth steel-making process. "A" rails are no longer manufactured because rails are now manufactured using a continuous casting process.

restriction on its track, and the CN attempted to weld and grind the affected areas. The industry, however, has not determined the best long-term remedial action.

The chief engineer of Conrail, who also was the president of the American Railway Engineering Association, told the Safety Board that flattened rail heads had not been discussed to any extent with other railroads, other than being reported on at various committees, with the CNW experience being the predominant incident.

The Safety Board is concerned that this condition may occur elsewhere and, thus, threaten the safety of train operations. The Safety Board recognizes that some time would be required to collect and analyze data to ascertain the cause of flattened rail and the extent of potential hazard. Safety enhancing steps, however, could be taken in the interim. The Federal Railroad Administration (FRA) issues a technical bulletin for its inspectors that could provide them with an interim aide in determining the hazard posed by flattened rail conditions. The bulletin could explain the circumstances of this accident and offer guidelines, based on such information as the speed, type, and operating area of a train. Therefore, the Safety Board believes that the FRA should develop not later than December 31, 1996, an interim technical bulletin authorizing track inspectors to take corrective action to prevent the potential hazard of flattened rail head conditions to train operations.

The Safety Board materials laboratory did not find any metallurgical defects in the flattened rail head involved in the Batavia accident. Although the reason for the flattening cannot be conclusively determined, the rail seemed to have much in common with other rail that has developed flattened rail head: it was an "A" rail manufactured in the 1970s that had been heavily used in terms of tonnage and high axle loads. Additional research is needed on flattened rail head to determine the type of rail that is likely to flatten, the conditions that will cause it to flatten, and the risk posed by the flattening. The Safety Board believes that the FRA should conduct appropriate research and develop a data base that can be used to assess the risk posed by flattened rail heads. In addition, the Safety Board believes that the AAR and the American Short Line Railroad Association, in conjunction, should assist the FRA in developing the data base.

As a result of the Safety Board's investigation of the Batavia accident, Conrail devised a working definition of flattened rail head that could be used when considering whether to replace flattened rail. Conrail defined it as rail head that has a depression that is at least 12 inches long and 0.25 inch deep. The chief engineer stated that the definition is arbitrary and had been chosen as a starting point. The definition would be more valuable if it were based on an understanding of the correlation between risk and degree of flattening. However, both the FRA and the industry lack the necessary data. The Safety Board concludes that the FRA track safety standards fail to address flattened rail head condition risks such as found in this accident. Therefore, the Safety Board believes that the FRA should develop guidelines, using the data compiled about the risk of flattened rail heads, for track inspectors to use in identifying flattened rail head that may be hazardous to train operations and also regulations to ensure that corrective action is taken when such flattened rail head conditions have been identified.

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

Develop not later than December 31, 1996, an interim technical bulletin authorizing track inspectors to take corrective action to prevent the potential hazard of flattened rail head conditions to train operations. (Class II, Priority Action)(R-96-12)

Conduct appropriate research and develop a data base that can be used to assess the risk posed by flattened rail heads. (Class II, Priority Action)(R-96-13)

Develop guidelines, using the data compiled about the risk of flattened rail heads, for track inspectors to use in identifying flattened rail head that may be hazardous to train operations and also regulations to ensure that corrective action is taken when such flattened rail head conditions have been identified. (Class II, Priority Action)(R-96-14)

The Safety Board also issues Safety Recommendations R-96-15 to the National Railroad Passenger Corporation, R-96-15 and -17 to the Association of American Railroads, and R-96-18 and -19 to the American Short Line Railroad Association

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 recommendations in this letter. Please refer to Safety Recommendations R-96-12 through -14. If you need additional information, you may call (202) 382-6840.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concur in these recommendations.

By: 
Jim Hall
Chairman