National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: April 16, 2002

In reply refer to: R-02-15

Mr. Edward Hamberger
President
Association of American Railroads
50 F Street, N.W.
Washington, D.C. 20001

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 recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation is derived from the Safety Board's investigation of the May 27, 2000, derailment of Union Pacific Railroad (UP) train QFPLI-26 at Eunice, Louisiana, and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued three safety recommendations, one of which is addressed to the Association of American Railroads (AAR). Information supporting this recommendation 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 recommendation.

On Saturday, May 27, 2000, about 11:48 a.m., 33 of the 113 cars making up eastbound UP train QFPLI-26 derailed near Eunice, Louisiana. Of the derailed cars, 15 contained hazardous materials and 2 contained hazardous materials residue. The derailment resulted in a release of hazardous materials with explosions and fire. About 3,500 people were evacuated from the surrounding area, which included some of the business area of Eunice. No one was injured during the derailment of the train or the subsequent release of hazardous materials. Total damages exceeded $35 million.[1]

The National Transportation Safety Board determined that the probable cause of the May 27, 2000, derailment of UP train QFPLI-26 was the failure of a set of joint bars that had remained in service with undetected and uncorrected defects because of the UP's ineffective track inspection procedures and inadequate management oversight.

[1] For more information, see National Transportation Safety Board, *Derailment of Union Pacific Railroad Train QFPLI-26 at Eunice, Louisiana, May 27, 2000*, Railroad Accident Report NTSB/RAR-02/03 (Washington, D.C.: NTSB, 2002).

During wreck-clearing operations, a rail with pieces of two broken joint bars attached to its east end was found. The following day, investigators located a similar rail with broken pieces of joint bars attached. Metallurgists at the site indicated that the two pairs of broken joint bars matched, which was later reaffirmed by a closer examination at the Safety Board's Materials Laboratory.

Based on the engineer's statements, on the physical evidence exhibited by the broken joint bars and the damage to the end face of the rail that is consistent with wheel impact, and on the laboratory examination of the joint bars, the Safety Board concluded that the joint bars found at the point of the derailment had broken before the arrival of the accident train, which allowed the rail to become misaligned.

Observing track from a moving inspection vehicle is the most common method of inspecting track, and this is the method the UP used; however, this method is inadequate for detecting defective joint bars. From the operator's position in the vehicle, the inspector cannot see any part of the outside joint bar on the passenger side of the vehicle and can see only the tops of the two joint bars on the operator's side. Even those joint bars that can be partially seen by the inspector may have small fractures that are extremely difficult, if not impossible, to see from a moving vehicle.

The UP chief engineer told investigators that on the Beaumont Subdivision, the rail was inspected for internal defects twice a year. The UP had done the last rail inspection for internal defects on the main track with its DC-9 test car on April 11, 2000, and had found five rail defects. According to its summary report of rail detector car results on the Beaumont Subdivision for 1999, the UP, using rail test cars, had conducted internal rail inspections on April 20, July 22, and October 12. On February 2, 2000, the UP did a track geometry inspection between milepost (MP) 556 and MP 584 (the derailment occurred near MP 567) and did not find any track geometry defects within the area of the derailment.

Investigators found that in the 5 months before the derailment, UP track inspectors had detected and replaced 128 defective joint bars. However, after the derailment, various walking inspections of the entire 44-mile section of jointed rail revealed 403 defective joint bars, indicating that regular track inspections had resulted in a significant number of defective joint bars remaining undetected.

As evidenced by the numerous joint bars that were found with fatigue cracks of varying lengths, a joint bar with a fatigue crack can remain in service for some time before failing completely. And although fatigue crack growth rates will vary depending on the type and frequency of forces exerted upon the joint bars, a fatigue crack, once initiated, can be expected to grow until it causes complete failure of the bar. Laboratory examination of the pair of broken joint bars found at the derailment site revealed that the fractures in those bars resulted from fatigue cracks, and while it cannot be determined when the cracks were initiated, they were certainly evident in the bars for some time before the bars failed in this accident. The Safety Board concluded that the UP track inspection procedures in use before the derailment were inadequate in that inspectors identified only a small proportion of the cracked or broken joint bars on the subdivision, with the result that defective joint bars that should have been replaced were allowed to remain in service.

After the derailment, the UP added to the *Union Pacific Engineering Track Maintenance Field Manual* the requirement that jointed rail territory that carries more than 10 million gross tons and is class 2 track or higher be subject to quarterly walking inspections. Included in the manual is an explanation of the proper method of inspecting rail joint bars and the requirement that the dates and locations of walking inspections be recorded on the track inspection reports.

Although the Federal Railroad Administration (FRA) did not conduct a regular track inspection on the Beaumont Subdivision in the 13 months before the derailment, it did do a track geometry car inspection 47 days before the derailment. The track geometry car did not detect an unusual amount of poor track surface or alignment. The car did not, and was not designed to, detect track component defects—such as fatigue cracks in joint bars or defective crossties—that did not affect track geometry.

UP officials stated that the route from Freeport, Texas, to Livonia, Louisiana, was designated a key route because of the types and volumes of hazardous materials carried over it. The AAR, in its Circular No. OT-55-B, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials*, states that mainline track on key routes "must be inspected by rail defect detection and track geometry inspection cars or any equivalent level of inspection no less than two times each year."

As noted earlier, inspections conducted by UP and FRA inspectors using special cars designed to detect internal rail defects or variances in track geometry did not and could not identify cracks or breaks in joint bars that did not affect track geometry. The Safety Board concluded that inspections of jointed rail using rail defect detection or track geometry cars are inadequate to identify the types of joint bar defects that led to this accident.

The National Transportation Safety Board therefore makes the following safety recommendation to the Association of American Railroads:

> Revise the guidance in your Circular No. OT-55, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials*, to recommend that all key routes be subjected to periodic track inspections that will identify cracks or breaks in joint bars. (R-02-15)

The Safety Board also issued safety recommendations to the Federal Railroad Administration and the Union Pacific Railroad. In your response to the recommendation in this letter, please refer to Safety Recommendation R-02-15. If you need additional information, you may call (202) 314-6607.

Chairman BLAKEY, Vice Chairman CARMODY, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

Original Signed

By: Marion C. Blakey
Chairman