

SP-20
Log R-488A

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: February 20, 1985

Forwarded to:

Mr. R. K. Davidson
Vice President - Operations
Missouri Pacific Railroad
Missouri Pacific Building
St. Louis, Missouri 63103

SAFETY RECOMMENDATION(S)

R-85-1 through -3

About 10:09 a.m. on November 12, 1983, Amtrak train No. 21 (The Eagle), with 162 persons aboard, derailed near Woodlawn, Texas, while traveling at 72 mph on the Missouri Pacific Railroad (MP). The train was traveling westbound on the single main track when it passed over a section of rail that a repair crew had just installed to replace a broken rail. The break had occurred at a field weld in a length of new, continuous-welded, 136-lb RE section, chrome-vanadium alloy, high-strength, vacuum-treated rail, which had been installed in the track about 1 month earlier. The temporary repair consisted of removing a length of the outer rail in a curve and replacing it with a 19-foot 6-inch length of rail bolted in place. The repair insert was a section of used, 136-lb RE section, standard-carbon rail. The repair crew used an oxyacetylene torch to cut both the new alloy rail and the used standard-carbon rail during the repair. The accident resulted in 4 passenger fatalities and 72 injuries. Damage was estimated to be more than \$2,180,000. 1/

Although the MP had a stated policy, published in its chief engineer's instructions, of not cutting rail with a torch except in emergencies, it is apparent that the stated policy was not, in fact, a working practice. The actions and statements of the track inspector, track foreman, and welder indicate that torch-cutting of rail, in lieu of using the preferred rail saw, was a routine and common practice, contrary to the MP's published instructions and stated policy. Moreover, it is apparent that the published policy of placing a 10-mph speed restriction on rails cut with a torch in an emergency situation also was not a working practice. The actions and statements of the track inspector, track foreman, welder, and especially the roadmaster indicate a serious deficiency in the training in MP schools about procedures applicable to their respective positions, since none of them was fully cognizant of the procedures. They also apparently were not cognizant of applicable Federal regulations, since they allowed the freight train to pass over the track repair while each of the rail ends of the continuous welded rail had

1/ For more detailed information, read Railroad Accident Report--"Derailment of Amtrak Train No. 21 (The Eagle) on the Missouri Pacific Railroad, Woodlawn, Texas, November 12, 1983" (NTSB/RAR-85/01).

only one bolt--rather than the required two bolts--installed in each of two joints. The Safety Board believes that the actions of the MP maintenance employees involved in the accident indicate that the training and testing of MP maintenance-of-way personnel must be improved.

The Safety Board is particularly concerned with the training and testing given the track inspector and roadmaster who were responsible for the decision that the track was safe for rail traffic. The roadmaster stated that he had been asked by the division superintendent to expedite the train movements, which would have included the Amtrak train movement. From the accident site, Amtrak train No. 21 would have required approximately 9 additional minutes at 72 mph to reach its next scheduled stop at Marshall, Texas, which was to have been at 9:31 a.m. Since the accident occurred at 10:09 a.m. approximately 10.7 rail miles from Marshall, the train was running approximately 40 minutes behind schedule. These factors may have influenced the decisions on how the repairs were made and whether to place a slow-order on the track at the work site. In order to comply with applicable Federal regulations and MP instructions, both the freight train and the Amtrak passenger train would have had to be held until the track repair had been completed, with four track bolts (two to each rail end per joint) installed. The leading freight train could then have been allowed to pass over the temporary repair at 10 mph, with the passenger train following the freight train, also at 10 mph, resulting in considerable additional delay to Amtrak train No. 21.

Compliance with the chief engineer's instructions on cutting rail would have necessitated the use of a rail saw. The rail saw assigned to the repair crew reportedly did not function, necessitating cutting the rail with a torch. The decision to cut the rail with a torch may have been affected by the much greater speed by which rail can be cut with a torch as compared to using a rail saw. Similarly, imposition of a slow-order would have further delayed the schedule of Amtrak train No. 21. Moreover, since the site of the temporary repair was within centralized traffic control territory with automatic wayside signals under MP rules, the track inspector should have arranged for a signal maintainer to be at the work site to insure the integrity of the signal system. His failure to do so is a further indication of undue haste in response to directions to expedite train movements.

Indifference to proper maintenance procedures such as cutting rail with a torch, incomplete bolting of joints, omitting prescribed slow orders, and proceeding without essential personnel are situations which should not be tacitly encouraged or condoned by management. The activities preceding this accident suggest that not only are first-line supervisors inadequately instructed on company maintenance-of-way policies, but also that their superiors have not been exercising effective direction and monitoring of routine practices being used on a day-to-day basis.

The Safety Board believes that systematic followup of rail failures in main tracks and other important tracks should be a standard procedure performed by any railroad. If the MP had had a requirement mandating that the failed field weld cut out from the chrome-vanadium alloy rail be retained for inspection or for laboratory analysis, the track repair crew involved in this accident might have been reluctant to use a torch to cut the rail, knowing that the torch cuts would be discovered. The Safety Board notes also that the MP had not requested information on whether the chrome-vanadium alloy rail had any characteristics which would require special installation and maintenance procedures differing from those for standard-carbon rail, even though the MP did not set forth any

specifications for the chrome-vanadium alloy rail when that rail was purchased. Moreover, the Safety Board notes that Krupp-Stahl, the manufacturer of the chrome-vanadium alloy rail, did not furnish information to the MP on whether the rail had any such characteristics.

The MP, as well as other railroads, have purchased and installed chrome-vanadium alloy rail and other high-strength alloy rail for the purpose of reducing the rate of rail replacement in locations of severe rail wear, such as in curves and track switch stock rails. A task force report commissioned by the Federal Railroad Administration (FRA) on the rail failure in this accident also has indicated that the use of alloy rail, while currently very limited, will increase significantly because of the economic benefits of its wearability. The Safety Board does not question the appropriateness of industry seeking such economic benefit. However, the Board is concerned that indifference to proper methods of rail installation and maintenance which can result in safety hazards in any rail presents acute hazards when using certain high-strength alloy rails, such as chrome-vanadium alloy rail. The Safety Board's concern led to the issuance, during the investigation of this accident, of Safety Recommendation R-84-20 on April 20, 1984, to the American Railroad Engineering Association, the Association of American Railroads and its membership, and the American Short Line Railroad Association, which states:

Review and revise, where necessary, procedures for the installation and maintenance of high-strength alloy rails, especially high-strength chrome-vanadium alloy rails, to minimize the possibility of externally induced stress factors in such rails and to implement more stringent internal defect testing programs.

The majority of railroads that have responded to Safety Recommendation R-84-20 have rules and procedures in effect which specifically ban the use of a torch to cut rail except in an emergency situation. All of the railroads that have responded indicate that they have rules and procedures in effect which stipulate that rail cutting with a saw or rail chisel is the preferred method. Although the responses to Safety Recommendation R-84-20 do not comprehensively state the complete policies of all railroads regarding torch-cutting practices, the Safety Board believes they do indicate a consensus that cutting any rail with a torch is an unacceptable practice. Further, the Safety Board notes that although the FRA minimum track safety standards do not address the subject of torch cutting of rail at present, they do prohibit torch-induced bolt holes.

Therefore, the National Transportation Safety Board recommends that the Missouri Pacific Railroad:


Review and revise, where necessary, the curriculum and/or training and testing procedures in its maintenance-of-way training schools to instruct employees in all of the procedures and requirements related to their positions. (Class II, Priority Action) (R-85-1)

Review and revise, where necessary, supervisory procedures for monitoring adherence to Federal regulations regarding minimum track safety standards and Missouri Pacific Railroad maintenance-of-way rules and procedures. (Class II, Priority Action) (R-85-2)

Arrange for metallurgical evaluations of the various heats of chrome-vanadium alloy rail presently in track to establish specific installation, maintenance, and operating procedures for Missouri Pacific Railroad tracks containing chrome-vanadium alloy rail. (Class II, Priority Action) (R-85-3)

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 actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.


By: Jim Burnett
Chairman