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Log # R-623B



## National Transportation Safety Board

Washington, D.C. 20594  
Safety Recommendation

DLA - 89-MR-004

Date: July 20, 1990

In reply refer to: R-90-26 and -27

Mr. William H. Dempsey  
President and Chief Executive Officer  
Association of American Railroads  
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Washington, D.C. 20001

About 7:36 a.m., Pacific daylight time, on May 12, 1989, Southern Pacific Transportation Company (SP) freight train I-MJLBP-111, which consisted of a four-unit locomotive on the head end of the train, 69 hopper cars loaded with trona, and a two-unit helper locomotive on the rear of the train, derailed at milepost 486.8, in San Bernardino, California. The entire train was destroyed as a result of the derailment. Seven homes located in the adjacent neighborhood were totally destroyed and four others were extensively damaged. Of the five crewmembers onboard the train, two on the head end of the train were killed, one received serious injuries, and the two on the rear end of the train received minor injuries. Of eight residents in their homes at the time of the accident, two were killed and one received serious injuries as a result of being trapped under debris for 15 hours. Local officials evacuated homes in the surrounding area because of a concern that a 14-inch pipeline owned by the Calnev Pipe Line Company, which was transporting gasoline and was located under the wreckage, may have been damaged during the accident sequence or was susceptible to being damaged during wreckage clearing operations. Residents were allowed to return to their homes within 24 hours of the derailment.

About 8:05 a.m., on May 25, 1989, 13 days after the train derailment, the 14-inch pipeline ruptured at the site of the derailment, released its product, and ignited. As a result of the release and ignition of gasoline, 2 residents were killed, 3 received serious injuries, and 16 reported minor injuries. Eleven homes in the adjacent neighborhood were destroyed, 3 received moderate fire and smoke damage, and 3 received smoke damage only.

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In addition, 21 motor vehicles were destroyed. Residents within a four-block area of the rupture were evacuated by local officials.<sup>1</sup>

The investigation determined that the 38 SP cars in the train consist were equipped with empty-load devices. According to timetable instructions in effect at the time of the accident, loaded cars with these devices were to be considered the equivalent of 1 1/2 cars in determining tons per operative brake (i.e., 50 percent additional braking capability per car). At the time of the train derailment, this information was programmed into the computer system, which automatically calculated the tons per operative brake. This information was listed on the tonnage profile given to the crew of Extra 7551 East--69 tons per operative brake, based on a trailing tonnage of 6,150 tons.

The results of the brake tests performed on SP cars equipped with empty-load devices in June 1989 indicated that the tested cars had a normal braking capability of 1, rather than the 1 1/2 capability. The Safety Board concludes, therefore, that the tonnage profile given to the head-end crew of Extra 7551 East contained inaccurate information regarding the tons per operative brake. Based on the listed trailing tonnage of 6,150 tons, the tons per operative brake should have been listed as 88. Further, had the tonnage profile correctly listed the trailing tonnage as 9,000 tons, the tons per operative brake would have been listed as 130. However, even if a braking capability of 1, rather than the 1 1/2, had been used to calculate the tons per operative brake, with a trailing tonnage of 6,150 tons and 24 axles of dynamic brakes (which is what the engineer believed he had), the operating rules would still have permitted Extra 7551 East to be operated down the grade.

Despite the railroad industry's emphasis on the use of dynamic brakes to control a train, as reflected in the operating rules, timetable instructions, and engineer training programs, neither the carrier involved in this train derailment, the SP, nor the Federal Railroad Administration (FRA) required that the dynamic brake system on a locomotive be tested or be functional. The Safety Board is concerned that certain rules and special instructions regarding the operation of trains, particularly in mountain territory, require a train to have a certain number of axles of dynamic brakes, yet there is no rule to require that the dynamic braking system on a locomotive be functional or even tested.

Testimony by the head-end engineer revealed, however, that SP personnel are familiar with the procedure for testing the dynamic brakes. The only positive method is for someone to read the ammeter in each unit of the locomotive consist while moving above 15 mph to ensure sufficient current while in the dynamic braking mode. This test method, however, was not followed before Extra 7551 East began descending the 2.2-percent grade, even

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<sup>1</sup>For more detailed information, read Railroad Accident Report-- "Derailment of Southern Pacific Transportation Company Freight Train on May 12, 1989, and Subsequent Rupture of Calnev Petroleum Pipeline on May 25, 1989, at San Bernardino, California" (NTSB/RAR-90/02).

though sufficient dynamic braking was critical to the safe operation of the train down the grade. The Safety Board believes that the status of a system as critical to the safe movement of the train as the dynamic brake system should be tested before departure and that testing should be required by both the FRA and the railroads. The Safety Board does, however, have concern about the safety involved with having an employee climb from one locomotive to another while the train is moving. With today's technology, the Safety Board believes that a positive method could be developed to indicate to the operating engineer in the cab of the controlling locomotive unit the status of the dynamic brakes on all units in the train. Furthermore, the Safety Board believes that the Federal Railroad Administration and the Association of American Railroads are the appropriate agencies to research this issue and develop an appropriate method for transmitting dynamic brake information to the cab of the controlling locomotive unit.

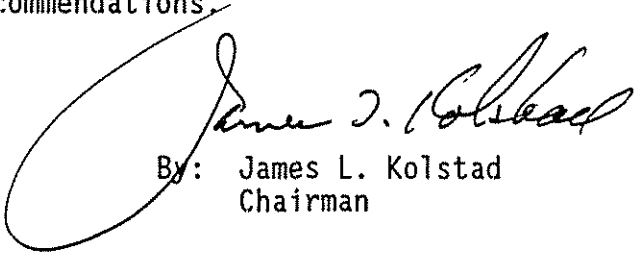
Therefore, the National Transportation Safety Board recommends that the Association of American Railroads:

Study, in conjunction with the Federal Railroad Administration, the feasibility of developing a positive method to indicate to the operating engineer in the cab of the controlling locomotive unit the condition of the dynamic brakes on all units in the train. (Class III, Longer Term Action) (R-90-26)

Inform your members of the circumstances of the train derailment at San Bernardino, California, on May 12, 1989, and notify them of the braking capability of cars equipped with empty/load devices, advising that timetable instructions and operating rules should be revised accordingly. (Class II, Priority Action) (R-90-27)

Also, the Safety Board issued Safety Recommendations R-90-12 through -21 to the Southern Pacific Transportation Company; R-90-22 through -25 to the Federal Railroad Administration; P-90-22 and -23 to the Calnev Pipe Line Company; I-90-18 and -19 to the City of San Bernardino; P-90-24 and -25 to the Research and Special Programs Administration; and I-90-20 to the National Association of Counties and the National League of Cities. The Safety Board also reiterated Safety Recommendations P-84-26, P-87-6, P-87-7, and P-87-22 to the Research and Special Programs Administration and R-89-50 to the Federal Railroad Administration.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, and LAUBER and BURNETT, Members, concurred in these recommendations.

  
By: James L. Kolstad  
Chairman