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808# R-623A



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 20, 1990

In reply refer to: R-90-22 through -25

Honorable Gilbert Carmichael
Administrator
Federal Railroad Administration
400 7th Street, S.W.
Washington, D.C. 20590

About 7:36 a.m., Pacific daylight time, on May 12, 1989, Southern Pacific Transportation Company (SP) freight train 1-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.¹

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 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.

Because of conflicting testimony from SP personnel regarding the company's interpretation of FRA requirements for functioning dynamic brakes, the Safety Board requested that the FRA provide in writing its position on this issue. The FRA responded, "If a dynamic brake or regenerative brake system is in use, that portion of the system in use shall respond to control from the cab of the controlling locomotive." The Safety Board does not agree with FRA's further statement that this "makes clear that both the equipping and the use of dynamic brake is optional." Moreover, the Safety Board is disappointed with FRA's position that it will not take exception if a dynamic brake is found inoperative or not operating properly. Given the emphasis on dynamic brakes in operating rules, in timetable instructions, and in training

¹For 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).

programs for engineers, and given the lack of a requirement for testing dynamic brakes, the Safety Board firmly believes that if a locomotive is equipped with dynamic brakes, the dynamic brakes should be functional. Consequently, the Safety Board believes that the FRA should revise its regulations accordingly.

According to SP's general road foreman, all new locomotives being purchased are equipped with event recorders, and event recorders are being installed on existing locomotives during major overhaul. The investigation of the derailment of Extra 7551 East demonstrates the need for all locomotives to be equipped with event recorders. While the Safety Board obtained pertinent information from the readout of the stripcharts generated from the event recorders installed on three of the lead locomotive units, other pertinent data were not available because the two helper locomotive units and the fourth lead unit were not equipped with event recorders. For example, had the helper units been equipped with event recorders, more accurate information would have been available concerning the time when the helper engineer placed the train brakes into emergency. Also, had the fourth lead unit, unit 9340, been equipped with an event recorder, amperage activity from dynamic braking should have been recorded; this information would have aided in determining whether or not the dynamic brakes on that unit were functioning. The Safety Board continues to believe that event recorders are not only an invaluable investigative tool in determining the cause of accidents and preventing future accidents, but also a management tool that can be used to monitor compliance with operating rules, particularly speed restrictions. The Safety Board notes that the SP has established a program to equip existing locomotives with event recorders.

The Safety Board's position regarding the mandatory use of event recorders in the railroad industry has been well documented in previous accident investigations, through the issuance of safety recommendations to the industry and the FRA, and in comments on Federal rulemaking proposals. The Safety Board addressed the issue of a Federal regulation requiring event recorders in its investigation of a head-on collision between two Iowa Interstate Railroad freight trains near Altoona, Iowa, on July 30, 1988.² The Board stated:

The Safety Board believes that the Rail Safety Improvement Act of 1988 mandates rules requiring event recorders and that it does not give the FRA freedom to decide whether Federal regulatory intervention on this subject is necessary. The Board is concerned, based on the FRA's past considerations of this issue, that the FRA will arbitrarily decide that Federal regulations are not justified or warranted. The Board believes that the intent of Congress is explicit and that the FRA should take immediate action and issue the rulemaking requiring event recorders in the railroad industry.

² Railroad Accident Report--"Head-on Collision between Iowa Interstate Railroad Extra 470 West and Extra 406 East with Release of Hazardous Materials, near Altoona, Iowa, July 30, 1988" (NTSB/RAR-89/04).

As a result of the Altoona accident, the Safety Board issued the following safety recommendation to the FRA:

R-89-50

Expedite the rulemaking requiring the use of event recorders in the railroad industry.

The FRA has not responded formally to the Board's recommendation. However, in a recent meeting between FRA and Safety Board staffs, agreement was reached on the general principle that some type of recording device should be required to be installed on trains. The FRA and Safety Board staffs will meet further to discuss the parameters of this issue. In spite of the agreement reached through this cooperative effort, the Safety Board remains concerned that rulemaking activity has not been expedited. Consequently, Safety Recommendation R-89-50 remains in an "Open--Unacceptable Action" status, and the Safety Board reiterates the recommendation as a result of the Board's investigation of the San Bernardino accident.

The head-end engineer had been qualified over the territory by making one trip with a supervisor from Bakersfield to Tehachapi; this trip did not include the area in which the accident occurred. The Safety Board believes that supervisors cannot assess adequately the ability of engineers to operate trains properly over an entire territory by making one short ride with an engineer. In territory with mountainous terrain, supervisors, at a minimum, should ride with an engineer in both directions on the mountain grade before qualifying an engineer for the entire territory. Further, the ride should be performed on a train that is comparable in size and trailing tonnage to those typically most difficult to operate on that territory. Consequently, the Safety Board believes that the SP should revise its procedures accordingly for qualifying engineers, and that the FRA should promulgate regulations along the same line.

Therefore, the National Transportation Safety Board recommends that the Federal Railroad Administration:

Promulgate regulations regarding the qualification of engineers to require that supervisors ride with an engineer in both directions on mountain grade territory before qualifying the engineer over the entire territory and that the ride be performed on a train that is comparable in size and trailing tonnage to those typically most difficult to operate on that territory. (Class II, Priority Action) (R-90-22).

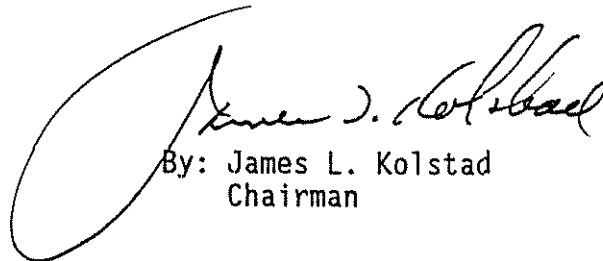
Study, in conjunction with the Association of American Railroads, the feasibility of developing a positive method to indicate to the operating engineer in the cab of the controlling locomotive unit the condition of the dynamic brakes on all units in the train. (Class III, Longer Term Action) (R-90-23)

Revise regulations to require that if a locomotive unit is equipped with dynamic brakes that the dynamic brakes function. (Class II, Priority Action) (R-90-24)

Require, in conjunction with the Research and Special Programs Administration, railroad operators to coordinate with operators of pipelines located on or adjacent to their railroad rights-of-way the development of plans for handling transportation emergencies that may impact both the rail and pipeline systems and then to discuss the plan with affected State and local emergency response agencies. (Class II, Priority Action) (R-90-25)

Also, the Safety Board issued Safety Recommendations R-90-12 through -21 to the Southern Pacific Transportation Company; R-90-26 and -27 to the Association of American Railroads; 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.

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



By: James L. Kolstad
Chairman