

SP-20

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

R 92R-506

ISSUED: May 16, 1985

Forwarded to:

Honorable John Riley  
Administrator  
Federal Railroad Administration  
Washington, D.C. 20594

SAFETY RECOMMENDATION(S)

R-85-51

Since 1971, the National Transportation Safety Board has investigated more than 30 major railroad accidents which involved the issues of the joint responsibility assigned by operating rules to the conductor and the engineer for the safety of the train, the failure of unassertive or inadequately trained crewmembers to take action when engineers were violating the rules, and the operation of locomotives by unqualified personnel for the assigned engineer. (See Attachment.) Many of the causal events in these accidents involved the failure of the engineers to carry out their responsibilities for proper operation of the trains.

In most of the accidents, the conductor was on the caboose at the rear of the train, a location which limited his ability to carry out his supervisory responsibilities over the engineer. In some investigations, the Safety Board learned that neither the conductor nor any other supervisor had seen the head-end crewmembers before they reported for duty or during their tour of duty. Among others, the Safety Board has identified the following major deficiencies which a conductor could have corrected or prevented before the accident occurred: (1) crewmembers reporting for duty under the influence of alcohol or using alcohol while on duty; (2) unauthorized persons operating the locomotive; (3) engineers failing to comply with operating rules with regard to speed and signal indications.

Generally, under the customary operating rules, a fireman or a head brakeman has been considered as a monitor and back-up in the safety system; however, evidence indicates that a trainman seldom is assertive in exercising his responsibility to act when the engineer is not abiding by the rules and often that engineers resent being monitored by a trainman (usually a head brakeman) who is not qualified to operate the locomotive.

The Safety Board first addressed the safety issue resulting from the assignment of responsibility jointly to the conductor and engineer for the safe operation of the train and made remedial recommendations in its report of the investigation of the head-on collision between Penn Central freight trains at Herndon, Pennsylvania, on March 12, 1972. As a result of that investigation, the Board recommended that the Federal Railroad

Administration (FRA) "In the promulgation of regulations governing railroad operating rules, where responsibility for safe operation of the train is assigned jointly to the engineer and conductor, require that they be located and informed so that they can make quick, effective decisions" (Safety Recommendation R-73-11). The Safety Board reiterated Safety Recommendation R-73-11 after it investigated a rear-end collision between two Southern Pacific freight trains at Indio, California, on June 25, 1973.

On July 6, 1973, the FRA advised the Safety Board that it agreed in substance with the recommendation and that an advisory committee on railroad operating rules was being established. In a letter dated October 10, 1974, the FRA said, in part, "An advisory committee on railroad operating rules is presently being established. This committee will undoubtedly recommend operating rules in accordance with the recommendation, provided that a decision is reached to make both engineer and conductor equally responsible for the safety of their trains. . . ." In 1977, changes in the language of Standard Rules 34, 99, and 93 were recommended to the Association of American Railroads (AAR). However, none of the changes in the rules responded directly to Safety Recommendation R-73-11. Because of the lack of positive action on this issue, the Safety Board placed the recommendation in a "Closed--Unacceptable Action" status.

Following the investigation of a rear-end collision of two CONRAIL freight trains at Muncy, Pennsylvania, on January 31, 1979, the Safety Board recommended that the Federal Railroad Administration "Promulgate regulations to require the conductor or other employee in charge of the train's operation to be located and informed so that he can properly supervise the safe operation of the train" (Safety Recommendation R-79-61).

In a response dated November 13, 1979, the FRA indicated that its understanding of the recommendation implied that the conductor "should be in the locomotive cab with the engineer so that he would take action if he observed any inattention on the part of the other crewmembers." The FRA rejected the recommendation on the basis that the conductor was needed on the caboose and that locating the conductor in the locomotive cab may not enhance the conductor's ability "to supervise the operation of the rear of the train." In ensuing correspondence, the Safety Board has attempted repeatedly to impress on the FRA and other involved organizations that the emphasis should be placed on procedures for keeping the conductor informed rather than on locating the conductor at a specific place.

On April 30, 1984, in response to a Safety Board followup letter on Safety Recommendation R-79-61, the FRA reiterated its previously stated position that ". . . its action in developing and enforcing the operating rules programs accomplished the intent" of the recommendation.

On February 4, 1976, two Penn Central freight trains collided head-on at Pettisville, Ohio. As a result of that investigation, the Safety Board recommended that the FRA "Promulgate rules to require engine crews to communicate fixed signal aspects to conductors while trains were en route on signalized track" (Safety Recommendation R-76-50). On May 13, 1977, the FRA said that it rejected Safety Recommendation R-76-50 because it believed "that in keeping train crews alert, a diligent, carrier-conducted rules instruction and testing program on operating rules would be a great deal more effective than would be Federally promulgated rules of the type recommended."

On December 24, 1980, the FRA responded further that it "believes that safe operations of trains can be accomplished through a continuous and vigorous training program in operating rules which includes effective proficiency testing. This approach recognizes unique and specific railroad operating conditions and thus affords a more flexible approach to achieve safe operating procedures."

On February 2, 1980, a Burlington Northern (BN) nine-unit locomotive collided with a standing train at Angora, Nebraska. The head brakeman and the engineer were killed and three crewmembers were seriously injured; property damage was estimated at \$1,297,000. As a result of its investigation, the Safety Board recommended that the BN "Insure that Rule 800, which assigns the responsibility for train operation to conductors, is adhered to strictly and conductors are adequately trained to make the necessary decision for the safe handling of the train" (Safety Recommendation R-80-35). The BN did not agree with the Board's recommendation and, consequently, the Board placed the recommendation in a "Closed--Unacceptable Action" status.

On October 16, 1980, two crewmembers were killed and two were injured when two Union Pacific (UP) freight trains were involved in a rear-end collision at Hermosa, Wyoming. Property damage exceeded \$990,000. The Safety Board reiterated Safety Recommendation R-76-50 and recommended that the AAR and the UP "Require the engine crews to communicate fixed signal aspects to conductors while trains are en route on signalized tracks" (Safety Recommendations R-81-48 and R-81-41, respectively). The UP rejected Safety Recommendation R-81-41 and said that the recommendation, "if followed, would create a serious hazard in that, if a conductor on the rear-end of a train were to misunderstand the communication or mistake a communication from another train, it could result in that conductor taking unnecessary emergency action resulting in possible injury and/or derailment." In its June 11, 1982, response to Safety Recommendation R-81-48, the AAR stated that it had discussed the recommendation "with a number of experienced, knowledgeable railroad officials, who, without exception, disagree with the conclusion of the Board. . .The carrier officers contacted believed that the crewmembers in the locomotive cab calling the aspect of the signals one to another is all that should be required." Safety Recommendation R-76-50 was discussed in the report on the rear end collision of Seaboard System freight trains at Sullivan, Indiana, on September 14, 1983, and placed in a "Closed--Superseded" status as a result of the Board's issuing Safety Recommendation R-84-30A to the FRA on June 18, 1984. Similar recommendations, R-84-32 and R-84-33, were issued to the AAR and the Seaboard System, respectively, as a result of the Sullivan accident, in which a similar safety issue was evident.

On December 28, 1981, a Louisville and Nashville Railroad Company (L&N) freight train struck the rear of a standing train after passing two restrictive signal indications at New Johnsonville, Tennessee. The failure of the conductor "to request clarification of a radio message from the dispatcher. . .when he did not understand the message" was considered as a contributing causal factor. The conductor of the standing train was killed, the engineer and head brakeman of the striking train were injured, and damage was in excess of \$998,000. The Safety Board recommended that the L&N "Require an engineer to radio the aspects displayed by all wayside automatic and interlocking home signals affecting movement of the train to the conductor, and have the conductor acknowledge the aspects called" (Safety Recommendation R-82-100).

The L&N rejected Safety Recommendation R-82-100, and on February 21, 1984, the Board placed the recommendation in a "Closed--Unacceptable Action" status. A similar recommendation, R-83-57, was issued to the Missouri Pacific on July 11, 1983, as a result

of the Board's investigation of the accident at Possum Grape, Arkansas. The Missouri Pacific rejected that recommendation and the Board has placed that recommendation in a "Closed-Unacceptable Action" status.

Since the December 28, 1981, accident, the Safety Board has investigated nine other major accidents in which the investigations identified deficiencies in the effective performance of the conductor's prescribed responsibilities for the overall management of the train and his joint responsibility with the engineer for the safe operation of the train. (See Attachment, Item Nos. 23 through 31.)

The foregoing indicates that the historical assignment of joint responsibility for the safe operation of the train to the engineer and conductor does not assure safe operation, particularly when the conductor is on the caboose. It appears that the conductor only rarely questions what the engineer is doing and, in fact, does not have to exercise any supervision. Many engineers discourage "interference" by conductors in purely train handling activities and even in train operations matters which clearly are within the supervisory responsibility of the conductor.

Recommendations by the Safety Board to address the adverse consequences of the failure of the joint assignment of responsibility rules to assure the safe operation of trains generally have been met with objections by all parties. The FRA has responded to almost all recommendations related to the problem with the opinion that ". . . a diligent, carrier-conducted rules instruction and testing program on operating rules would be a great deal more effective than would be Federally promulgated rules. . ." or that "The FRA also believes that safe operations of trains can be accomplished through a continuous and vigorous training program in operating rules including effective proficiency testing." The Board has no quarrel with the logic of this position; however, the assignment of joint responsibility has not worked successfully in practice. The responses and lack of action by FRA and the industry appear to be based on their acceptance of an established position with which they are comfortable, rather than on the need to remedy a serious safety problem. There does not appear to have been any much needed systematic safety analysis of this matter to account for the human elements in railroad accidents.

There is a basic flaw in a concept which assigns to the conductor the responsibility for safe operation of the train and then does not provide the conductor with the necessary information to make operational decisions. For example, a conductor cannot be expected to monitor speed and caution the engineer about over-speed if the conductor is in a location which does not provide access to either the signal aspects or a speedometer.

The thrust of the Board's early recommendations was to convey the idea that carriers who assign conductors responsibility for the management of the train should provide the conductors the necessary information to carry out their duties, or locate the conductors where they will have direct access to such information as speed indications and signal aspects. The protestations by the FRA and carriers that the conductor must be on the rear of a train because of the work requirements largely have been superseded by the change in work rules which allows cabooses to be eliminated under certain conditions.

The Safety Board has investigated several accidents (see Attachment, Item Nos. 18, 22, 23, 26, and 28) in which it found unauthorized persons operating the locomotives. The operation of locomotives by persons other than engineers is not an evolutionary result of the removal of firemen; however, its safety implications and adverse consequences have grown since carriers removed firemen from most freight trains. Based on evidence

disclosed during these investigations, the Safety Board determined that had there been a second person in the locomotive qualified to operate the locomotive, some of the accidents could have been avoided.

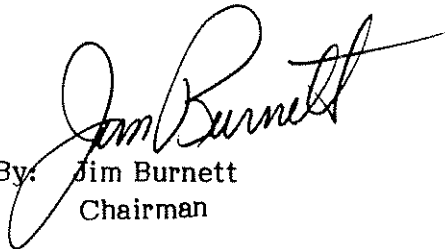
When the accident data is analyzed purely from a safety standpoint, without regard to union work rules or State laws, the need for more than one qualified train operator in the locomotive is obvious. Even on short routes, the locomotive operator needs relief occasionally. Therefore, the Safety Board concludes that safe freight train operations under most conditions require that at least two persons should be on the locomotive, one of whom should be in charge of the train, and that both persons should be qualified to operate the locomotive. Where the exigencies of the job require it, additional persons should be assigned to the operating crew. The Board's conclusion is based entirely on safety considerations and is without regard to work rules about crew size, rights of given crafts to certain work, or the continued use of cabooses.

Simply moving the conductor to the locomotive will not solve the problem of split responsibility for the safe operation of a train inherent in rules which make the engineer and the conductor jointly responsible. However, such a move would provide the conductor with access to operating data, such as speed indicators and signal aspects, before action had to be taken in respect to the train; moreover, it would provide the conductor the opportunity to assess the fitness of the other crewmembers and to monitor their performance. Further, even where there is mutual respect between the engineer and the conductor, evidence indicates that there remains a belief among engineers that the engineer is the final authority in matters involving the operation of the locomotive. An employee in charge should be assigned unambiguous responsibility for decision-making in all matters affecting the operation of the train. Moving the conductor to the locomotive without further training and changes in operating rules and practices will not address the need to provide a qualified person to operate the locomotive when the engineer needs relief. The designation of an employee who can operate the locomotive as person in charge of the train would be a step toward the solution of the split responsibility issue. Such a measure will provide two persons who are qualified to operate the locomotive, one of whom would be the person in charge who can make the decision as to which one will run the locomotive, as well as all other decisions which affect the operation of the train.

The Safety Board is fully aware that implementation of this measure involves a drastic change in philosophy and historical rights on the parts of management and labor. However, accidents continue to occur because one employee is not in clear charge with attendant accountability. These accidents result in the loss of lives, expose communities to dangers from hazardous materials spills, and cost the railroad industry millions of dollars annually. Accordingly, the Safety Board recommends that the Federal Railroad Administration:

Require that there be at least two crewmembers on locomotives of through freight trains who are qualified to operate the locomotive, that one of these two persons have total responsibility for the train and all employees thereon, and that the second person serve as the assistant to the person in charge. (Class II, Priority Action) (R-85-51)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in this recommendation.

  
By: Jim Burnett  
Chairman

## ATTACHMENT

	<u>Report No.</u>	<u>Railroad Accident Report Description</u>
1.	NTSB-RAR-72-4	Rear End Collision of Two Burlington Northern Freight Trains at Sheridan, Wyoming, March 28, 1971
2.	NTSB-RAR-73-2	Collision of Southern Railway Passenger Train with Derailed Cars at Penn Central Freight Train Being Yarded at Potomac Yard, Arlington, Virginia, April 27, 1972
3.	NTSB-RAR-73-3	Head-On Collision of Two Penn Central Freight Trains at Herndon, Pennsylvania, March 12, 1972
4.	NTSB-RAR-73-4	Head-On Collision of C. B. & O. Freight Trains Near Maquon, Illinois, May 24, 1972
5.	NTSB-RAR-74-1	Rear End Collision of Two Southern Pacific Freight Trains at Indio, California, June 25, 1973
6.	NTSB-RAR-75-3	Collision of Penn Central Freight Train With Counterweight of Open Lift Span Drawbridge at Cleveland, Ohio, May 8, 1974
7.	NTSB-RAR-75-6	Head-On Collision of SL-SF Freight Trains at Mustang, Oklahoma, September 1, 1974
8.	NTSB-RAR-75-9	Rear End Collision of Two Texas and Pacific Railway Company Freight Trains, Meeker, Louisiana, May 30, 1975
9.	NTSB-RAR-76-2	Central Transportation Company Train Collisions, Leetonia, Ohio, June 6, 1975
10.	NTSB-RAR-76-3	Rear End Collision of Alaska Railroad Trains near Hurricane, Alaska, July 5, 1975
11.	NTSB-RAR-76-10	Head-On Collision of Two Penn Central Transportation Company Freight Trains, Pettisville, Ohio, February 4, 1976

	<u>Report No.</u>	<u>Railroad Accident Report Description</u>
12.	NTSB-RAR-77-6	Head-On Collision of N&W Freight Trains, New Haven, Indiana, October 19, 1976
13.	NTSB-RAR-78-1	Collision of Two Conrail Freight Trains, Stemmers Run, Maryland, June 12, 1977
14.	NTSB-RAR-79-2	Head-On Collision of L&N Freight Trains, Florence, Alabama, September 18, 1978
15.	NTSB-RAR-79-6	Rear End Collision of Two Conrail Freight Trains, Muncy, Pennsylvania, January 31, 1979
16.	NTSB-RAR-79-9	Rear End Collision of U.P. Freight Trains, Ramsey, Wyoming, March 29, 1979
17.	NTSB-RAR-80-1	Rear End Collision of SP Freight Trains, Thousand Palms, California, July 24, 1979
18.	NTSB-RAR-80-2	Rear End Collision of Conrail Freight Trains, Royersford, Pennsylvania, October 1, 1979
19.	NTSB-RAR-80-7	Head-On Collision of Nine Burlington Northern Locomotive Units With A Standing Freight Train, Angora, Nebraska, February 6, 1980
20.	NTSB-RAR-80-10	Derailment of Western Pacific Railroad Company Freight Train Extra UP3734 West, Hayward, California, April 9, 1980
21.	NTSB-RAR-81-3	Rear End Collision of Two Southern Pacific Freight Trains, Hermosa, Wyoming, October 16, 1980
22.	NTSB-RAR-82-4	Rear End Collision of Louisville & Nashville, Freight Trains at New Johnsonville, Tennessee, December 28, 1981
23.	NTSB-RAR-83-5	Derailment of Illinois Central Gulf Freight Train Extra 9629 East (65-2-28) and Release of Hazardous Materials, Livingston, Louisiana, September 28, 1982
24.	NTSB-RAR-83-6	Side Collision of Two Missouri Pacific Freight Trains, Possum Grape, Arkansas, October 3, 1982
25.	NTSB-RAR-83-9	Rear-End Collision of Two Burlington Northern Railroad Company Trains, Pacific Junction, Iowa, April 13, 1983

<u>Report No.</u>	<u>Railroad Accident Report Description</u>
26. NTSB-RAR-84-2	Rear End Collision of Two Seaboard System Railroad Freight Trains at Sullivan, Indiana, September 14, 1983
27.	Side Collision of Two Conrail Freight Trains at Milbury, Ohio, November 11, 1983
28. NTSB/RAR-85/02	Collision of Two Conrail Freight Trains near Saltsburg, Pennsylvania, February 26, 1984
29. NTSB/RAR-85/04	Head-On Collision of Two Burlington Northern Freight Trains at Wiggins, Colorado, April 13, 1984
30. NTSB/RAR-85/04	Rear-end Collision of Two Burlington Northern Freight Trains at Newcastle, Wyoming, April 22, 1984
31. NTSB/RAR-85/06	Head-On Collision of Two Burlington Northern Freight Trains at Motley, Minnesota, June 14, 1984