



## National Transportation Safety Board

Washington, D. C. 20594

### Safety Recommendation

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Date: September 16, 1991

In Reply Refer To: R-91-23 through -26

Honorable Gilbert C. Carmichael  
Administrator  
Federal Railroad Administration  
U.S. Department of Transportation  
400 7th Street, S.W., Room 8206  
Washington D.C. 20590

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About 3:13 a.m. eastern daylight time, on August 9, 1990, northbound Norfolk Southern (NS) freight train 188 collided with southbound NS local freight train G-38 at control point DAVIS near Sugar Valley, Georgia. The conductor on train 188 and the conductor and engineer on train G-38 were fatally injured. The trainmen on both trains and the engineer on train 188 received minor injuries. Damage was estimated at \$1,268,680.<sup>1</sup>

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the engineer of train 188 to stop at the stop signal because he was asleep, distracted, or inattentive. Contributing to the accident were the failure of the conductor to monitor the engineer's performance and the failure of the brakeman and flagman to carry out their responsibilities to notify the engineer to stop the train.

Effectiveness of the Alerter.--The engineer on train 188 testified that when the train was about midway through the siding, the alerter activated and he reset it; thus, the system had been functioning normally. Enough time had elapsed between his resetting the alerter by placing the throttle in position 6 and the accident to trip the alerter system. Since the event recorder indicates that no further events occurred after he set the throttle at position 6, the alerter system should have activated about 60 seconds later. He also said that he had placed the train into emergency after having seen the headlight of train G-38. But the train did not come to a stop at the signal. This suggests that he must have reacted to the alerter, a reasonable assumption if the distance between the point where the engineer made

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<sup>1</sup>For more detailed information, read Railroad Accident Report--"Collision and Derailment of Norfolk Southern Train 188 with Norfolk Southern Train G-38 at Sugar Valley, Georgia, August 9, 1990" (NTSB/RAR-91/02).

the last throttle movement and the point where the accident happened was at least 2,376 feet<sup>2</sup>. However, even if he did react, he may not have been alert.

As Dr. Tepas has described, a sleeping person can discriminate sounds (and also lights) and perform reflex actions in response to a well known stimulus. The light on the alerters used on the NS locomotives flicker at a high frequency about 10 seconds before the alerter produces an auditory signal. The light is intense enough, especially in a darkened locomotive cab, for a sleeper to perceive it even though his eyes are shut. Since that light was a very well known warning signal to the engineer, as was the required response, the light may have triggered a simple response from him without fully awakening him. For example, he could have touched the wiper switch on the console, which would have reset the alerter timer.

In the past, railroads used various kinds of alerters. All of them had the same deficiency: they required the engineer to perform in ways that were either intrusive or interfered with his duties. Consequently, engineers often tampered with the alerters, making them ineffective. The alerting system on the accident locomotive was an improved one; however, it was so easily reset that it could be done by reflex action without conscious thought. The Safety Board believes that alerters should be made in such a way that they cannot be reset by an engineer who is merely performing a reflex action. The Safety Board recommends that the railroad industry research the feasibility of a locomotive alerter system that requires cognitive responses from the engineer to cancel or reset the system.

Physical Condition of the Crewmembers.--A number of the trains' crewmembers had hypertension, diabetes, and other medical conditions for which they were taking various prescription drugs. Although most of these prescription drugs are relatively harmless, sensitive users could develop side effects, such as headaches and dizziness. Moreover, Disulfiram may cause drowsiness. The surviving crewmembers denied experiencing any of these symptoms. However, while the side effects of individual drugs are well known, very little is known about the possible interaction of drugs when they are taken in combination, such as was done by at least one of the crewmembers.

Although the medicines taken by the crewmembers were reported by them and noted by the contract physician on the medical forms that were forwarded to the carrier after the crewmembers' physical examinations, the Safety Board is concerned that the medical condition of crewmembers and the drugs prescribed for these conditions by their private physicians were not being monitored by the carrier. As was noted previously, the NS does not require an employee to undergo a physical examination other than for vision and hearing until he turns 50. The only exception is the employee who is returning to duty after an extended absence caused by sickness or disciplinary action. Thus, serious illness and prescriptions required for such conditions by safety-sensitive personnel easily could go unnoticed by the carrier for extended periods of time. The engineer, for instance, had not been examined medically since 1985, a violation of company rules, which required a medical examination every 2 years. The Safety Board believes that the carrier's medical department should set up a system for monitoring its personnel in safety-sensitive positions for ailments that require them to take prescription drugs.

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<sup>2</sup>The train was traveling at an average speed of 27 mph, or 39.6 feet/second.

The FRA recently adopted Notice No. 1, RIN 2130-- AA 51, "Qualification For Locomotive Engineer."<sup>3</sup> The regulation requires that engineers be licensed and pass an examination of their hearing and visual acuity. Unfortunately, the regulation does not require engineers to have any other medical qualifications, other than that of being drug free. The Safety Board has supported requiring employees in safety-sensitive positions to periodically demonstrate minimum medical qualifications. Although individual carriers may have their own medical policies, there is no evidence that such policies are enforced, at least not at Norfolk Southern. The Safety Board believes the FRA should require standard periodic medical examinations of train crewmembers.

Positive Train Separation.--The Safety Board realizes much remains to be done before a complete advanced train control system (ATCS) can be implemented. Nonetheless, this is another accident that could have been averted had the ATCS system been available and installed. With transponders to monitor the train's location and speed and to provide moving braking distance parameters and information about how the train was being handled, the dispatch computer would have recognized that the train was not going to stop at the signal. The dispatch computer, through the data radio link, would have ordered the locomotive's computer to stop the train, thus preventing the collision. The Safety Board urges the industry and the FRA to expedite the development and use of the ATCS. The Safety Board issued Safety Recommendation R-87-16 in May 1987, requesting FRA to promulgate Federal standards to require the installation and operation of an ATCS in order to provide positive train separation. The FRA is continuing in its position that the railroads are developing an ATCS that will meet the intent of this safety recommendation. The FRA is "monitoring" the research and development process. The Board is holding to the position that the FRA should become actively involved in the development of the system, providing funding incentives and program direction to ensure a uniform implementation of a positive train separation feature of the ATCS. The status of Safety Recommendation R-87-16 is "Open--Response Received."

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

Establish a requirement for minimum medical standards for railroad personnel in the rule for "Qualifications for Locomotive Engineers." (Class II, Priority Action) (R-91-23)

Establish uniform medical requirements for train crewmembers that are based on reasonable standards consistent with current medical practices, and require carriers to provide their train crewmembers with periodic medical examinations based on these standards. (Class II, Priority Action) (R-91-24)

In conjunction with the Association of American Railroads and the Railway Progress Institute, expand the effort now being made to develop and install advanced train control systems for the purpose of positive train separation. (Class II, Priority Action) (R-91-25)

<sup>3</sup>Federal Register, Vol. 56, No. 118, June 18, 1991; "Qualifications for Locomotive Engineers"; Docket Mp RSOR-9, Notice No. 5, RIN 2130-AA51.

In conjunction with the study of fatigue of train crewmembers, explore the parameters of an optimum alerter system for locomotives. (Class II, Priority Action) (R-91-26)

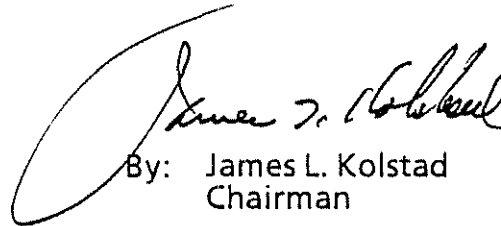
The Safety Board is also reiterating its recommendation that the Federal Railroad Administration:

R-87-16

Promulgate Federal standards to require the installation and operation of a train control system on mainline tracks which will provide for positive separation of trains.

Also, the Safety Board issued Safety Recommendations R-91-27 through -30 to the Norfolk Southern Corporation; R-91-31 to the Association of American Railroads; and R-91-32 to the Railway Progress Institute.

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



By: James L. Kolstad  
Chairman