



# National Transportation Safety Board

Washington, D. C. 20594

## Safety Recommendation

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**Date:** March 23, 1992

**In Reply Refer To:** R-92-2 through -4

Mr. W. Graham Claytor, Jr.  
President  
National Railroad Passenger Corporation  
60 Massachusetts Avenue, N.E.  
Washington, D.C. 20002

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At 8:23 a.m. on December 12, 1990, National Railroad Passenger Corporation (Amtrak) passenger train 66, consisting of a two-unit locomotive, two material handling cars, five passenger cars, one dining car, and two baggage cars, derailed and struck Massachusetts Bay Transit Authority (MBTA) commuter train 906, consisting of one locomotive, six passenger cars, and one control car, as both trains entered Back Bay station in Boston, Massachusetts.

Operated by an apprentice engineer, Amtrak train 66 was traveling 76 mph, within a 30-mph speed restriction, on a 9° 30' curve when it derailed and struck MBTA train 906 on the adjacent track. A fire ignited after the collision. On Amtrak train 66, 7 crewmembers and 43 passengers sustained injuries; on MBTA train 906, 5 crewmembers and 391 passengers were injured; and 7 firefighters sustained injuries. Estimated damage exceeded \$12.5 million.<sup>1</sup>

Locomotive engineers were traditionally promoted from the ranks of firemen. This promotional process is not always available now. The prospective locomotive engineer usually acquired familiarity with the physical characteristics of the operating territories by working as a engine crewmember for many years. During that time, he also acquired train-handling proficiency, judgment, and other necessary operating skills under the supervision of experienced engineers who provided individualized attention. Moreover, when engineers began working in passenger service, they had usually become experienced in operating other kinds of trains before advancing to higher speed equipment.

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<sup>1</sup>For more detailed information, read Railroad Accident Report--"Derailment and Collision of Amtrak Train 66 with MBTA Commuter Train 906 at Back Bay Station December 12, 1990 " (NTSB/RAR-92/01).

Through its locomotive engineer training program, Amtrak is trying to provide the same basic operating knowledge and skills, but within a much shorter time frame and more structured setting. Prospective engineers now receive at least part of their training in classes, and operating information pertaining to equipment and train control is technologically more advanced. The time allocated for completion of an entire engineer training program is sometimes less than 1 year. The National Transportation Safety Board believes that locomotive engineer training is a vitally important railroad management responsibility because the long-term promotional opportunities for seasoning through the ranks are diminishing.

Since the apprentice engineer who operated Amtrak train 66 was trained under Amtrak's locomotive engineer training program, investigators reviewed his training, as well as the training program itself. The Safety Board acknowledges that the program has many constructive features. However, the program also has several deficiencies, and a number of important training activities that management officials described and that are on the training program master sheet apparently have not been provided. Investigators also examined the relationship of the training program deficiencies to the accident events.

Combining the physical characteristics qualification phase of the training program with the on-the-job training (OJT) phase is one deficiency of concern to the Safety Board. The outline describing the training program shows different phases for these two activities, but the training is not consistently being conducted in that manner. In practice, familiarizing students with the territories and teaching them operating skills have been accomplished at the same time and, for some apprentices, almost in the time frame originally allocated for OJT alone.

In addition, Safety Board investigators believe that Amtrak does not necessarily assign apprentices to routes for territory familiarization in a manner consistent with apprentices' learning needs. For example, some apprentices did not know how long they had to learn their routes, some apprentices believed they needed more time to learn their routes, and the length of the assignments did not necessarily correspond to the difficulty of the routes. The Safety Board believes that Amtrak should administer the program so that the time allocated for physical characteristics training and the scheduling of related examinations allow apprentices to pace their learning tasks and to develop confidence in their proficiency.

The Safety Board is also concerned about the lack of documentation relating to apprentices' progress and development. Although Amtrak officials stated that two managers regularly observe and evaluate apprentices operating trains during OJT, no recently trained engineer who was questioned recalled such observations during his training. Of two experienced engineers questioned, only one recalled ever being asked to provide management officials with either a training item checklist or an oral account of how apprentices were doing. The Safety Board is concerned that because of this deficiency, some apprentices may have progressed through OJT without gaining knowledge of their operating strengths and weaknesses.

Moreover, in the absence of this documentation, Amtrak has no way to evaluate apprentices' progress in developing operating judgment and skills. Instructing engineers are also unable to assess apprentices' performance development level or deficiencies in operating skills until they actually observe the apprentices operating. The Safety Board urges Amtrak to revise its observation and evaluation procedures so that management and instructing engineers both have access to thorough documentation of apprentices' progress in all major learning

activities. This information should also be available to each apprentice to provide feedback on his training. The Safety Board is concerned that Amtrak managers responsible for overseeing the training program seemed unaware that documentation was not being provided or used.

Amtrak also needs to improve internal communication and coordination among training activities. The investigation disclosed that most communication and coordination between activities administered by the engineer training school (classroom and simulator training) and those administered by the transportation department (physical characteristics familiarization and OJT) exist solely to facilitate scheduling, rather than ensure overall quality control of the training phase. The manager of engineer training indicated that the school does not participate in the advancement of apprentices after they leave the school other than to schedule their final qualification on the Illinois Institute of Technology simulator. He also said that he did not know whether the apprentice engineer on Amtrak train 66 was qualified on the territory.

The Safety Board is also concerned that Amtrak is using only simulations of train operations as the final qualification procedure in the engineer training program. The Safety Board believes that in addition to any simulator evaluation deemed useful, final qualification of a passenger train engineer should currently include evaluations of all his or her operating tasks. These tasks should be performed on all equipment the engineer will be expected to operate and over all territories on which he or she has been qualified.

Amtrak did not provide special training for the locomotive engineers who were to serve as instructors during the physical characteristics familiarization and OJT phases. No engineer questioned during the investigation reported receiving information about how to teach or evaluate the apprentices. The Safety Board believes that all engineers who participate in instructional activities should receive intensive training in their teaching and evaluation tasks.

In addition, the Safety Board believes that engineers performing two tasks (instructing apprentices and operating equipment) simultaneously while operating trains is a training issue that has a direct bearing on passenger safety. Safety Board investigators learned that Amtrak has no systematic way of selecting engineers to serve as instructors. When Amtrak inaugurated the program, management paired apprentices with engineers for physical characteristics familiarization and OJT. More recently, however, the selection of an instructing engineer has frequently been left to the discretion of each apprentice.

The previous instructional experience of the Amtrak train 66 engineer notwithstanding, his record included two offenses that might have disqualified him from serving as an OJT instructor if a record of no operating offenses had been required. Even if less restrictive standards had been applied, the engineer might not have qualified as a supervisor of OJT because he apparently tended toward distraction while operating a train; that tendency had resulted in one of his rules violations. Although Safety Board investigators were unable to determine whether the engineer was engaged in teaching tasks as Amtrak train 66 approached Back Bay station, another apprentice described the engineer's instruction in physical characteristics as intensive throughout the trips. The Safety Board believes that Amtrak should select instructing engineers on the basis of several considerations, such as an exemplary operating and safety record, evidence of disciplined attention

to operating tasks under high workload conditions, and an aptitude for teaching and interpersonal skills, that are compatible with rigorous instruction.

The Safety Board tried to determine why the foregoing deficiencies remained even though the engineer training program had been in place for several years and had produced 13 apprentice classes. One reason is that the program had never been thoroughly evaluated. As a result, coordination difficulties, documentation needs, the reactions of apprentices to their training, and scheduling deficiencies were not identified and resolved. The Safety Board believes that Amtrak management needs to determine how training activities are integrated and coordinated in the program and to evaluate how these activities are contributing to or detracting from the training program mission.

Therefore, the National Transportation Safety Board recommends that the National Railroad Passenger Corporation:

In cooperation with the Brotherhood of Locomotive Engineers and the United Transportation Union, conduct a comprehensive evaluation of the locomotive engineer training program and incorporate needed changes. (Class II, Priority Action) (R-92-2)


Develop and implement an intensive final qualification procedure that includes information from all major training activities and that verifies apprentice engineers' competency in actual operating conditions and on typical equipment they will be expected to operate. (Class II, Priority Action) (R-92-3)

Incorporate in the locomotive engineer training program prescribed criteria for selecting and training engineers who are to serve as instructors. (Class II, Priority Action) (R-92-4)

Also, the Safety Board issued Safety Recommendations R-92-1 to the Federal Railroad Administration; Safety Recommendation R-92-5 to the Brotherhood of Locomotive Engineers; and Safety Recommendation R-92-6 to the United Transportation Union.

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 action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations R-92-2 through -4 in your reply.

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

By:   
Susan M. Coughlin  
Acting Chairman