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NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: January 5, 1981

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Forwarded to:  
  
Mr. E. G. Jordan  
Chairman and Chief Executive Officer  
Consolidated Rail Corporation  
6 Penn Center Plaza  
Philadelphia, Pennsylvania 19104  
  
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SAFETY RECOMMENDATION(S)  
  
R-80-51 through -53

About 7:56 a.m., on July 17, 1980, Southeastern Pennsylvania Transportation Authority (SEPTA)-Consolidated Rail Corporation (Conrail) commuter train No. 472 struck the rear of SEPTA-Conrail commuter train No. 406 while it was standing on the No. 2 track east of the station at North Wales, Pennsylvania. The rear car of train No. 406 overrode and destroyed the empty lead car of train No. 472. Of the estimated 321 persons on the 2 trains, 64 passengers and 3 crewmembers received injuries. Damage to the equipment was estimated at \$1,475,000. 1/

Train No. 472 was en route from Doylestown, Pennsylvania, to Reading, Pennsylvania, at the time of the accident. The train consisted of, from front to rear, electrically propelled cars Nos. 9020, 123, 124, 114, and 113. The train experienced electrical problems with cars Nos. 9020, 114, and 113 at Doylestown, and the problems persisted en route. In addition to the cars shutting down, the automatic brakes were being applied in undesired emergency applications. Between Doylestown and Lansdale, Pennsylvania, in an effort to keep the train operable, train No. 472 was stopped and the crew electrically isolated cars Nos. 9020, 114, and 113 from cars Nos. 123 and 124 by opening the contactor plates of the automatic coupler, through which the electrical circuits are transferred from one car to another, between cars Nos. 9020 and 123 and between cars Nos. 124 and 114.

Since lead car No. 9020 was electrically isolated from cars Nos. 123 and 124, the engineer could no longer operate the train from the operating position in that car. The dispatcher authorized the engineer to operate the train from car No. 123, the second car, and the dispatcher later instructed the crew to set off car No. 9020 in a yard track at Lansdale.

1/ For more detailed information read "Railroad Accident Report—Rear-End Collision of Southeastern Pennsylvania Transportation Authority-Consolidated Rail Corporation Trains Nos. 406 and 472 on Conrail Track, North Wales, Pennsylvania, July 17, 1980" (NTSB-RAR-80-11).

To assist in the operation of the train, the conductor assigned the brakeman to ride in the operating compartment of car No. 9020 en route to Lansdale. The brakeman was instructed to sound the whistle for road crossings and to advise the engineer in car No. 123 of any restricting wayside signals or unusual conditions of the roadway ahead which would affect the operation of the train. Because car No. 9020 was electrically isolated from the train, there was no operable radio in the car and no operable intercom or buzzer systems between cars Nos. 9020 and 123. Therefore, it was agreed that the brakeman would pass hand signals outside of the train to the engineer in the second car. As a backup system the conductor agreed to stand in the center aisle of car No. 123 near the engineer where he could see the brakeman signal through the car of any conditions requiring action by the engineer. The engineer was aware of the arrangement.

When the train arrived at the Lansdale siding where car No. 9020 was to be set off, the crew was unable to unlock an 8-minute timelocked derail so the facing point switch could be aligned for the siding. The crew requested permission to move car No. 9020 to the Reading Terminal and to operate from Lansdale to Reading without making station stops. The dispatcher gave his approval, and at 7:52 a.m., train No. 472 left Lansdale on track No. 2 in a medium to heavy rain. The maximum authorized speed for operating a train under such circumstances was 30 mph.

As train No. 472 approached wayside signal No. 330, 4,720 feet west of the North Wales station, the signal displayed an "approach" aspect. The brakeman looked back outside the car for the engineer to confirm the signal indication, but he did not see the engineer. Since the brakeman considered the train's speed to be in accordance with the rules, even though the speedometer in car No. 9020 was not operable, he made no further attempt to pass a signal. The engineer later said he could not lean out of the window to receive or to observe signals because it was raining and the water running from car No. 9020 hit him in the face.

After the train passed wayside signal No. 330, the brakeman saw the whistle board west of North Wales which required the engineer of an approaching train to sound the whistle for the Beaver Street crossing in North Wales. About the same time, he saw the lighted headlight of a train ahead. He later stated that at the time he could not distinguish on which track the train was or if it was moving toward or away from him. He said he did not see red marker lights displayed to the rear. He said he saw a green light ahead but he did not remember seeing a distinguishable signal aspect. Shortly after he saw the headlight, he turned to the rear and attempted to pass a signal through the car to the conductor to warn the engineer to reduce speed, but the signal apparently was not received.

By the time train No. 472 was near the North Wales station, moving about 38 mph, the brakeman realized that there was a train ahead on track No. 2, and he activated the single-car auxiliary brake in an attempt to stop the train, but it had no effect on the train's speed. The brakeman then moved from the operating compartment into the car's interior and grabbed for the conductor's emergency brake valve located just inside the aisle door, but it was not actuated. He ran toward the rear of the car to tell the engineer to stop the train. The conductor, who had seen his attempt to activate the emergency brakes, told the engineer to make an emergency brake application. There was no apparent reduction in the 38-mph speed of train No. 472 before it struck the rear of train No. 406. The engineer later said that he did not believe he was moving too fast.

The brakeman of train No. 472 was not qualified on the characteristics of the roadway at the accident site. Because of the nature of the work performed by the conductor and traincrew on commuter trains, which essentially is ticket collecting, it is not easy for them to remain knowledgeable about the characteristics of the roadway. They seldom are in a position to view the roadway ahead and keep abreast of physical changes, or to refresh themselves on the locations of signals and curves. Traincrew personnel are not required to requalify on any portion of the system as long as they make one trip a year over the territory on which they are qualified. Conrail has a responsibility to insure that operating personnel maintain a high state of qualification for the duties they are required to perform. Training or retraining could be more positively controlled if a mandatory, well organized program were in effect.

On July 16, 1980, car No. 9020 was dispatched from the Reading Terminal, in Philadelphia, Pennsylvania, as the rear car in train No. 489, with the motor alternator, lights, and air conditioning inoperative. The discrepancy was reported to a supervisor by the conductor of the outbound train, but the car was allowed to depart without any corrective action. In addition to this problem, a severe electrical storm moved through the Philadelphia area during the evening and train No. 489 was delayed en route to Doylestown, arriving there at 11:50 p.m. Several times during the trip, catenary power was lost and the train was stopped. During these times the power for the lights on the train was supplied by the batteries.

During the layover period at Doylestown, no repairs were made and no further inspection was made of car No. 9020 except that which was made by the crew of train No. 472. Conrail does not have any mechanical maintenance personnel permanently assigned at Lansdale or Doylestown. When such services are required, personnel are dispatched, usually, from Wayne Junction.

The problems of train No. 472 probably were caused by weak batteries. The fact that car No. 9020 departed the Reading Terminal the previous evening with no lights, air conditioning, or traction power suggests that the batteries were depleted on the car at that time. Conrail supervisory personnel knew that car No. 9020 would be the lead car on its return trip to the Reading Terminal unless it was switched to another position or to another train. Yet, no qualified electrician or car inspector was dispatched to Doylestown to check the car. Apparently, none of the supervisors to whom the trouble was reported took any action to have the car checked.

The communities served by the SEPTA-Conrail commuter service place a high priority on that service. To protect and insure that service, Conrail should have competent personnel to check the equipment laying over at outlying terminals before it begins a return trip to the Reading Terminal each day. If SEPTA had required a preventive maintenance procedure, such a program might have prevented the accident.

Therefore, the National Transportation Safety Board recommends that the Consolidated Rail Corporation:

Develop and implement a program for training and periodically requalifying operating personnel and train dispatchers on the physical characteristics of the system over which they operate. (Class II, Priority Action) (R-80-51)

Develop and implement a program for training and periodically requalifying operating personnel on the mechanical and electrical characteristics of commuter cars to include some elementary troubleshooting and corrective measures. (Class II, Priority Action) (R-80-52)

Provide for the inspection by competent maintenance personnel of equipment laying over at outlying terminals before it is released on a scheduled run. (Class II, Priority Action) (R-80-53)

KING, Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations. DRIVER, Vice Chairman, did not participate.



By: James B. King  
Chairman

