R-205E

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: April 13, 1979

Forwarded to:

Honorable John M. Sullivan
Administrator
Federal Railroad Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

R-79-37 through 40

About 6:30 p.m., on June 9, 1978, northbound Conrail commuter train No. 400, consisting of four self-propelled cars, struck the rear of Amtrak train No. 60, the Montrealer, consisting of 1 locomotive unit and 14 cars, at Seabrook, Maryland. The impact caused eight cars of Train No. 60 and three cars of train No. 400 to be derailed. Sixteen crewmembers and 160 passengers were injured and damage was estimated to be $248,000. 1/

Train No. 60 received an "approach" indication at signal 128R near the Capital Beltway Station. After stopping, the train departed from signal 128R at restricted speed as authorized by the operating rules. However, the locomotive developed operating problems, and the engineer called the Landover (Maryland) operator by radio to advise him that he was going to stop. As the train was slowing to a stop, it was struck in the rear by train No. 400.

Train No. 400 had received a "stop" aspect at signal 128R. About 90 seconds after the train was stopped, the aspect changed to "stop and proceed," which permitted train No. 400 to depart at restricted speed of 15 mph or less. The engineer reported that his cab signal changed from a "restricting" to an "approach" aspect about 3,168 feet north of signal 128R, and that he increased the train's speed by an undetermined rate. As train No. 400 proceeded through a 1° curve to the right, the engineer saw the rear of train No. 60 ahead. He said that he made a full service brake application and then placed the brakes in emergency. When he realized that his train was not going to stop before striking train No. 60, he moved back into the first car to warn the passengers. Several seconds later, train No. 400 struck the rear of train No. 60.

1/ For more detailed information read "Railroad Accident Report--Rear End Collision of Conrail Commuter Train No. 400 and Amtrak Passenger Train No. 60, Seabrook, Maryland, June 9, 1978" (NTSB-RAR-79-3).

Because of the engineer's warning, passengers in the forward section of the first car of No. 400 were able to brace themselves for the impact. However, the other passengers on the train had no advance warning, and they were injured when they were propelled into the unrestrained seatbacks. Some passengers struck unpadded metal border strips along the tops and sides of the seatbacks and metal ticket holders located on the top of the seatbacks. The Safety Board concluded that if the commuter cars on train No. 400 had been designed to eliminate injury-producing interior features, the number of injuries resulting from the collision would have been greatly reduced.

Emergency personnel were unable to open the center side doors of train No. 400 from the outside of the car because no means of operating the doors on the outside had been provided. They were also unable to open the center side doors from the inside because the cabinet containing the operating mechanism was unmarked and they were unfamiliar with this equipment. Amtrak and Conrail had not provided training and familiarization for railroad emergencies to local rescue organizations.

Passengers of both trains had little or no guidance in evacuating the trains and obtaining medical assistance. The conductor of train No. 400 did not know how to manually open the center side door, so many of the passengers had to be removed through the windows. Unaware of prescribed emergency procedures, crewmembers did little to help injured passengers. Passengers left the cars on their own initiative or at the direction of rescue personnel. Train crewmembers had not been given any formal training in the care of passengers in an emergency or derailment.

Emergency release mechanisms for doors and instructions for their operation should be clearly marked for use in case of derailment, collision, and fire. In this accident, the door operating instructions were locked inside the cabinet containing the operating device in the cars of train No. 400, and there was no sign on the cabinet to indicate the device was inside. The conductor of train No. 400 had not been trained to use the device.

Although the locked cabinet prevents misuse of the device during normal operations, the Safety Board believes that it is important to provide passengers a means of escaping from a car on their own without depending on crewmembers who may be disabled in an accident. While emergency windows permit escape, they are not as safe a means of exit as regular exit doors. Locks could be installed to prevent doors from being operated when power is applied.

On Amtrak's Northeast Corridor, Conrail employees operate Amtrak passenger trains, Conrail freight trains, and Conrail commuter trains. This division of responsibility creates a problem of insuring that crewmembers are properly qualified on the equipment to be operated. Amtrak accepts a Conrail employee as being qualified by the very act of reporting for an Amtrak assignment. In addition, Conrail does not monitor crewmembers for type of service on the Northeast Corridor because Conrail is not responsible for train operation. Because this investigation revealed that the engineer used the brakes improperly and the crewmembers lacked knowledge of emergency procedures, the Safety Board believes that Amtrak should accept responsibility for training and qualifying crewmembers who operate Amtrak passenger trains.

A cab signal aspect which momentarily changes to a less favorable aspect is described as a cab signal "flip" and is not unusual. A cab signal aspect which momentarily changes to a more favorable aspect is very unusual; however, occurrences of this type are identified as cab signal failures. The cab signal failure as described by the engineer of train No. 400 could occur if stray or noise voltage were induced into the cab signal equipment. The investigation revealed a rail joint with a broken bond wire at a point north of signal 128R. This rail joint was located near where the engineer claims to have received the "approach" aspect. This broken rail joint bond wire could have created a condition that caused an unbalance in the return traction current, which may have possibly caused a cab signal failure as described above. Subsequent testing at Seabrook revealed that the necessary conditions did not exist at that time to have sustained the "approach" in the cab signal, however.

The Safety Board on June 16, 1976, recommended (R-76-31) that the Federal Railroad Administration observe a statistically adequate sample of trains equipped with cab signals to establish the reliability of this system and take appropriate remedial action based on these findings. The FRA responded on February 16, 1978, that based on observations, it believes the existing cab signal systems are adequate and reliable. However, since a design fault that results in an oscillation of the amplifier was found in testing the cab signal equipment involved in this accident, the Safety Board concludes that the FRA should reopen the study on the reliability of cab signal systems.

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

> Initiate a study of cab signal equipment that analyzes the relationship between noise levels, traction motor return current and the filter characteristic of blocking, and its impact on the quality of the signal received by the cab signal. (Class II, Priority Action)(R-79-37)

Promulgate regulations to establish minimum standards for the design and construction of the interiors of passenger-carrying cars so that adequate crash-injury protection will be provided passengers. (Class II, Priority Action)(R-79-38)

Promulgate regulations requiring that the emergency release mechanism for doors on passenger-carrying cars be clearly identified so that the doors can be opened easily by passengers in an emergency. (Class II, Priority Action)(R-79-39)

Promulgate regulations establishing minimum standards for the training of traincrews in the safe operation of trains and in emergency procedures. (Class II, Priority Action)(R-79-40)

KING, Chairman, DRIVER, Vice Chairman, McADAMS and HOGUE, Members, concurred in the above recommendations.

By: James B. King
Chairman