R-210A

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: September 27, 1978

Forwarded to:

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

SAFETY RECOMMENDATION(S)

R-78-54 through 56

About 2:10 a.m., on February 24, 1978, 19 cars and a locomotive unit of Auto-Train No. 4 derailed on the Seaboard Coast Line Railroad (SCL) track at Florence, South Carolina. Twenty-four of the 503 passengers were injured. The total accident damage was estimated to be $774,029. 1/

The accident resulted from a locomotive axle failure which originated from an undetected internal defect that developed during the manufacturing process. The axle that failed and caused the derailment at Florence had been tested and inspected at least three times before the accident by methods prescribed by the Association of American Railroads. When new, it was ultrasonically tested for voids by the manufacturer, Bethlehem Steel Corporation. Twice, when being reconditioned by the SCL, the magnetic particle method was used to test the axle for defects.

In spite of these tests and an improved Auto-Train maintenance program, the axle failed. The magnetic particle method can detect cracks only when visible on the axle surface, and while ultrasonic testing is capable of detecting such flaws beneath the axle surface, the AAR requires its use only for new locomotive axles.

1/ For more detailed information on this accident, read "Railroad Accident Report--Derailment of Auto-Train No. 4 on Seaboard Coast Line Railroad, Florence, South Carolina, February 24, 1978," (NTSB-RAR-78-6). Copies of the report will be available after October 15, 1978.

Since current procedures and test methods failed to detect this defective axle, regulations should be promulgated that require prescribed tests to detect internal defects in a locomotive axle to avoid service failure. Therefore, the National Transportation Safety Board recommends that the Federal Railroad Administration:

> Revise 49 CFR 230.213, Axles, to establish specifications for the manufacturing and testing of locomotive axles to insure the discovery of internal defects before they are placed in service. (Class II, Priority Action) (R-78-54)
>
> Revise 49 CFR 230.213, Axles, to establish procedures and methods to test in-service locomotive axles to insure the detection of internal defects so they may be removed from service. (Class II, Priority Action) (R-78-55)
>
> Develop a method that will automatically detect the failure of a locomotive unit truck or any of its components, independent of crew observation. (Class II, Priority Action)(R-78-56)

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

By: James B. King
Chairman