Log # R-673 & B

National Transportation Safety Board

SR-1

Adopted: 12-18-97 Washington, D.C. 20594

Safety Recommendation

Date: January 5, 1998

In reply refer to: R-97-59

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About 6:28 a.m. on Saturday, November 23, 1996, eastbound National Railroad Passenger Corporation (Amtrak) train No. 12 derailed while crossing Portal Bridge, a swing bridge spanning the Hackensack River in Secaucus, New Jersey. When the train derailed, it sideswiped Amtrak train No. 79, which was crossing the bridge in the opposite direction on an adjacent track. All 12 cars of train No. 12 derailed, with both locomotives, 1 material handling car, and the 3 head passenger coaches coming to rest at the bottom of an embankment at the east end of the bridge. Train No. 79 sustained damage but was able to stop with the entire train intact and on the rails some distance west of Portal Bridge. No fatalities resulted from the accident, but 42 passengers and crewmembers aboard train No. 12 were injured, as was 1 passenger aboard train No. 79. Estimated cost of the damaged train, track, and signal equipment and site cleanup exceeded $3.6 million.[1]

One of the issues raised by the accident was the effectiveness of the event recorder inspections undertaken by Amtrak. Amtrak inspects each locomotive, including the event recorder, every 60 days, and each of the accident locomotives had been inspected and approved within 6 weeks of the accident. These inspections did not, however, identify that an incorrect current module configuration rendered all traction motor current (TMC) information recorded by the event recorders invalid. Amtrak's event recorder specialist told the National Transportation Safety Board that the problem was not detected earlier because TMC was not considered a significant parameter. In the view of the Safety Board, TMC *is* an important parameter, particularly since potentially critical cab signal data are recorded on the same channel. The Safety Board concluded that if the entire event recorder systems, including sensors, wiring, etc.,

[1]For further information, see Special Investigation Report — *Derailment of Amtrak Passenger Train No. 12 and Sideswipe with Amtrak Train No. 79 on Portal Bridge in Secaucus, New Jersey, November 23, 1996* (NTSB/SIR-97/01).

in Amtrak locomotives 910, 901, and 930 on the two accident trains had been thoroughly tested during their most recent 60-day inspections, the incorrect current module configuration would likely have been found and corrected, and the TMC data retrieved after the Portal Bridge accident would have been useful in determining preaccident cab signals received by the traincrews.

It is important to note that the invalid data found during this investigation resulted from failed or inappropriately configured "sensors" and not from the event recorder units themselves. Most solid-state recorders have a self-test feature that can diagnose problems with the event recorder, but this feature does not test the validity of the data being provided to the unit. For example, a broken speed sensor might send the event recorder a speed of 0 mph. The recorder cannot detect whether the sensor is broken or the train simply is not moving, and the self-test does not extend to sensors or sending units. Currently, no testing or inspection is required for microprocessor-based self-testing recorders so long as the recorder indicates no faults during self-tests. Even for recorders that have no self-test feature, regulations do not require that the entire system be inspected, only the recording unit itself.

The issue of inadequate event recorder testing and inspection is not new to the Safety Board. As a result of its investigation of an accident involving the derailment of a freight train near Cajon Junction, California, in February 1996,[2] the Safety Board made four safety recommendations to the Federal Railroad Administration (FRA) regarding event recorders. One recommendation specifically addressed event recorder maintenance and inspection procedures. It called for the FRA to

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> Revise 49 *Code of Federal Regulations* 229.25(e)(2) to require that event recorders, including microprocessor-based event recorders that are equipped with a self-test function, be tested during the quarterly inspections of the locomotive in such a manner that the entire event recording system, including sensors, transducers, and wiring, is evaluated. Such testing should include, at a minimum, a review of the data recorded during actual operation of the locomotive to verify parameter functionality as well as cycling all required recording parameters and determining the full range of each parameter by reading out recorded data.

In an August 15, 1997, letter to the Safety Board, the FRA stated that it had referred this recommendation to its Rail Safety Advisory Committee (RSAC). The letter stated that "the RSAC process will lead to expedited action" on the recommendation. The Safety Board will follow the progress on this recommendation closely.

At the same time, however, the Safety Board believes that additional action is needed immediately. All three recorders involved in the Portal Bridge accident, as well as the one

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[2]Railroad Accident Report — *Derailment of Freight Train H-BALTI-31 Atchison, Topeka, and Santa Fe Railway Company near Cajon Junction, California, February 1, 1996* (NTSB/RAR-96/05).

recorder involved in the Cajon Junction accident, were tested and found to be fully functional after the accident. The problems discovered with all four recorders were not related to the recording units themselves, but to the vital system components that send signals to the recording device. The self-test functions do not, nor are they intended to, detect failures in these components.

Based on the foregoing information, the National Transportation Safety Board recommends that the Association of American Railroads:

> Pending the results of the Federal Railroad Administration Railroad Safety Advisory Committee Event Recorder Working Group and the Federal Railroad Administration's implementation of suitable requirements concerning event recorder system maintenance, advise your member railroads of the need to test and inspect all microprocessor-based event recorders equipped to perform self-tests in accordance with those procedures outlined in 49 *Code of Federal Regulations* 229.25(e)(2), which currently apply to all other types of recorders, to confirm proper event recorder function. (R-97-59)

Also, the Safety Board issued Safety Recommendations R-97-49 through -54 to the National Railroad Passenger Corporation, R-97-55 through -58 to the Federal Railroad Administration, and R-97-60 to the American Short Line Railroad Association.

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 recommendation in this letter. Please refer to Safety Recommendation R-97-59 in your reply. If you need additional information, you may call (202) 314-6488.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By: Jim Hall
Chairman