

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: January 25, 1980

Forwarded to:

Mr. L. Cena
President
Atchison, Topeka and Santa Fe
Railway Company
80 East Jackson Boulevard
Chicago, Illinois 60604

SAFETY RECOMMENDATION(S)

R-80-2 and 3

About 6:10 a.m., on October 2, 1979, Amtrak passenger train No. 4, the Southwest Limited, en route from Los Angeles, California, to Chicago, Illinois, with 3 locomotive units and 18 cars, derailed all locomotive units and 17 cars. The train derailed in a 7° curve of the single main track of the Atchison, Topeka and Santa Fe Railway Company (AT&SF) about three-fourths of a mile west of the station in Lawrence, Kansas.

The three locomotive units and four of the cars overturned and came to rest on their sides; all other cars remained upright. The train was carrying 177 passengers and crewmembers. Two Amtrak employees were killed and 69 persons were injured; 20 persons were hospitalized.

The track approaches the westerly city limits of Lawrence in the vicinity of the Kansas River. A series of six curves adjacent to the river, including the 7° curve in which the train derailed, begins about 1 mile west of the Lawrence station. The AT&SF has a permanent speed restriction of 30 mph through these curves. The maximum authorized speed for passenger trains approaching these curves is 90 mph. Permanent speed restrictions on curves and at other locations are listed in the timetable and are designated by restricted speed signs and mile post locations.

Trains are operated according to signals of an automatic block signal system (ABS) which is supplemented with an automatic train stop system (ATS). Trackside inductors for the ATS system are located at all block signals and about 1 mile before all curves having permanent speed restrictions of less than 45 mph. When passing signals with indications other than "proceed," the engineer must acknowledge by depressing a button so that the train brakes will not be applied automatically. Inert inductors ahead of curves must always be acknowledged by the engineer in the same manner to preclude the automatic application of brakes.

The engineer and fireman on train No. 4 were not familiar with the route because this was their first trip eastbound over the route in more than a year. Both stated that they did not see the inert inductor or the restricted speed sign for the six curves at Lawrence; consequently the engineer did not acknowledge the inductor. However, there was no automatic application of the train's brakes after passing over the inductor. Since it was dark and the restricted 30 mph sign was not in place, the engineer continued operating the train at a speed up to 78 mph into the 7° curve without being aware that he had reached it.

During postaccident testing of the ATS system, the Safety Board found that the ATS system did not function or functioned erratically on several Amtrak trains. These malfunctions occurred even when the locomotive ATS equipment was tested and found to be operative before the locomotive left the initial terminal. However, none of the current test procedures involve the actual application of brakes under service conditions.

Current AT&SF rules require acknowledgement within 15 seconds before arrival at an inductor location. Since on most Amtrak locomotives an engineer receives no indication whether the system is functioning when he acknowledges before passing over an inductor, the "pre-acknowledgement" procedure will not alert him if the ATS system is inoperative. Only if acknowledgement is deferred until the locomotive passes over an inductor will an alarm sound. This alarm indicates that the ATS is operative and alerts the engineer to "post-acknowledge" the system. Then, if the engineer does not depress the button within 4 to 6 seconds after the alarm, the brakes will apply automatically.

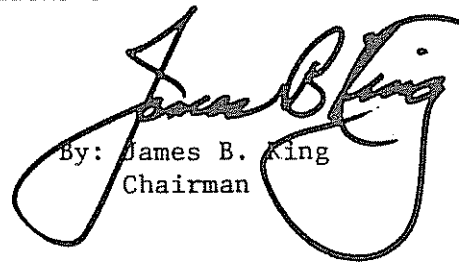
Therefore, to better insure that ATS equipment is functioning on locomotives before being dispatched in-service, and to provide a positive indication if and when ATS equipment becomes defective en route, the National Transportation Safety Board recommends that the Atchison, Topeka and Santa Fe Railway Company:

Establish requirements for testing of automatic train stop (ATS) equipment over inert inductors at initial terminals before in-service departure of locomotives to determine that both the ATS alarm will sound and the brakes will automatically apply. (Class I, Urgent Action) (R-80-2)

(3)

Establish rules and procedures which require crewmembers operating Amtrak locomotives to post-acknowledge all automatic train stop (ATS) inductor locations unless the ATS equipment has a pre-acknowledgement device which indicates that the system is functioning. (Class I, Urgent Action) (R-80-3)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.


By: James B. King
Chairman