

*Log R-457A*

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: January 4, 1984

Forwarded to:

Honorable John Riley  
Administrator  
Federal Railroad Administration  
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)  
R-83-106 and -107

About 5:55 a.m. on April 3, 1983, Amtrak passenger train No. 820 (The Crescent), en route from New Orleans, Louisiana, to Washington, D.C., with 331 passengers and 18 crewmembers aboard, derailed when it struck a landslide near Rockfish, Virginia, on Southern Railway System (SR) track about 23 miles south of Charlottesville, Virginia. Heavy rains in the area preceded the landslide. The track had been inspected 6 hours before the accident. The train was moving about 48 mph at the time of the accident. There was no train order in effect for reduced speed in the area of the derailment. Twenty-four persons were injured, and damage was estimated to be \$232,000, 1/

Land stabilization along railroad rights-of-way is a universal problem. There are many areas where track was laid decades ago in cuts and other areas that do not meet current construction standards. Some of these areas, especially in mountainous terrain, cannot be modified to eliminate the landslide hazard. Thousands of slides that occur in the United States each year are detected before a train strikes them. Railroads have used many methods, such as slide detection fences and track inspections, to deal with unstable areas. Many railroads operating in the same area and on the same terrain as the SR use slide detection fences. If the track at the accident site had been equipped with a slide detection fence, the landslide would have been detected, and the signal that train No. 820 passed about 1/2 mile before the accident site would have changed to red. Unless the landslide had happened only minutes before train No. 820 approached, a slide detection fence probably would have prevented this accident.

The best methods of reducing the hazard of landslides, however, are methods that both predict and attempt to prevent landslides. The stability of a slope can be determined by the measurement of the displacement of earth or rocks. Stakes driven into the ground in slide areas and instrumentation such as tilt meters (inclinometers) can be used to determine movement. Although SR records show that the slope at MP 135.2 had remained stable since 1860, the leaning of the trees on the slope should have alerted someone to the possibility that some earth movement had occurred before this landslide. A slide causing a derailment had occurred 13 months before at a similar slope 0.7 mile south of the accident site. The Rockfish area had received 7.75 inches of rain in the 30 days preceding the April 3 slide. The trainmaster's oral instruction to southbound train No. 819 showed that he was concerned about the possibility of a slide or washout in the accident area.

1/ For more detailed information read Railroad Accident Report—"Derailment of Amtrak Train No. 820 (The Crescent), on Southern Railway System Track, Rockfish, Virginia, April 3, 1983" (NTSB/RAR-83/10).

Consideration of all these circumstances should have caused the SR to be more cautious about train movements in the area on April 3 even though the heavy rains had stopped, and should have prompted the SR to examine closely the slope stability in the area of heavy rain.

Currently, it is not possible to determine precisely how many reported railroad accidents involve landslides because landslide damage to track is reported to the Federal Railroad Administration (FRA) under the same blanket category as washout, rain, flood, snow, and ice damage. The SR, like most railroads, does not keep data on the numbers and locations of landslides along its track. Because landslide conditions are more predictable than weather conditions, it might be more revealing and useful if landslide accident data were to be reported in a category separate from other weather-related accident data. The FRA should consider changing its reporting requirements to accomplish this.

The events that cause or contribute to a landslide are related to geological and meteorological factors. The lack of vegetation on an earth slope generally is considered to be a contributing factor to erosion, which can lead to landslides and other problems which damage the environment. Recommended practices of the Federal Highway Administration (FHWA) do not discourage use of vegetation on slopes on highway rights-of-way. The American Railway Engineering Association lists the planting of vegetation as one method of stabilizing earth slopes on railroad rights-of-way. On the other hand, it is possible that excessive vegetation on certain types of soil could lead to a landslide. Determination of the precise cause of the slide that caused this accident would require analysis far beyond the needs of the Safety Board to determine the cause of the accident and to recommend remedial measures. However, the Safety Board believes there can be no question but that the clearing of vegetation on the slope at MP 135.2 by burning and the unusually heavy rainfall in the area were factors in this landslide.


Although the FHWA-recommended practices pertain to highway right-of-way construction and maintenance, the information in some of the guidelines can be applied to railroad right-of-way maintenance. The FRA should review this information and disseminate to railroads pertinent information to use in railroad right-of-way stabilization programs.

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

Require that landslides on railroad rights-of-way be reported separately from other weather-related accident data. (Class II, Priority Action) (R-83-106)

Review information available from the Federal Highway Administration regarding highway right-of-way construction and maintenance, and disseminate to railroads information pertinent to railroad right-of-way stabilization programs. (Class II, Priority Action) (R-83-107)

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

  
By: Jim Burnett for  
Chairman