Railroad Accident Investigation Reports

REPORT No. 79-3

ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY
SUMMIT, CALIFORNIA
MARCH 6, 1978

U.S. Department of Transportation
Federal Railroad Administration
Office of Safety

RAILROAD ACCIDENT INVESTIGATION

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FEDERAL RAILROAD ADMINISTRATION

OFFICE OF SAFETY

WASHINGTON, D. C. 20590

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Synopsis

At 4:07 p.m., March 6, 1978, an Atchison, Topeka and Santa Fe freight train derailed at Summit, California, while moving at a speed of 50 m.p.h. The accident occurred under clear weather conditions.

Casualties

The engineer sustained extensive injuries to the chest and jaw. The front brakeman was slightly injured.

Two deadhead brakemen riding in the control compartment of the second locomotive unit were fatally injured. Both men were crushed and their remains were cremated in the ensuing fire.

Cause

The accident was caused by previous rainfall in the area which allowed the landfill to become saturated and not support the track structure.

Damages

The four locomotive units and the first 16 cars derailed. According to the carrier's estimate, the cost of damages to the rolling equipment and track structure was $2,115,984.

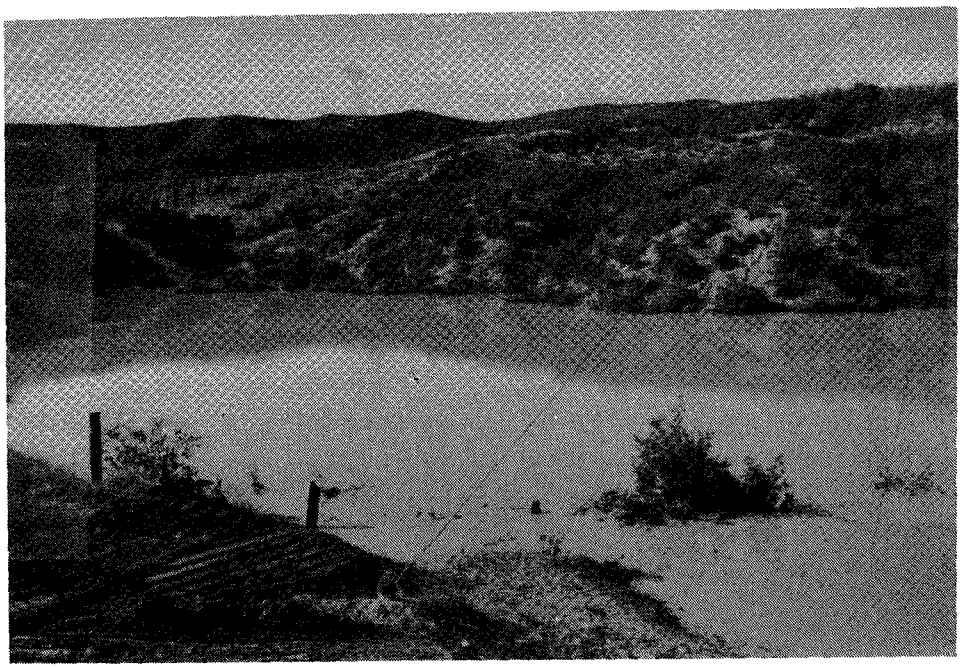
Railroad Operation and Physical Characteristics

The accident occurred on that part of the railroad extending from San Bernardino to Barstow, California, a distance of 83.3 miles. In the accident area this is a double-track line over which trains operate in either direction by signal indications of a traffic control system.

The derailment occurred on the north track, 1.36 miles east of Summit.

From the west there are, successively, a $2^{\circ}30'$ curve to the left 2,213 feet, a tangent 1,026 feet, and a 2° curve to the right 841 feet to the point of accident and 522 feet beyond. The grade is 0.25% descending for eastbound trains.

In 1972, the carrier conducted a line change in the accident area and the new main tracks were lowered 12 to 15 feet and relocated 86 feet to the south. Both the original and the new main tracks were laid on a landfill composed of native materials, consisting mostly of sand and gravel. This landfill, about 300 feet in length and 61 feet in height, formed a dam impounding the water in a ravine north of the main tracks. Since there had never been a drainage problem with the original landfill, no drainage provisions were provided during the new track relocation. The old main track was left on the original fill and designated "Spur Track No. 15."



View looking north from "Spur Track No. 15" showing the water impounded north of the landfill.

Authorized Speed

The maximum authorized speed for freight trains in the accident area is 50 m.p.h.

Sight Distance

Track curvature and mountainous terrain limit the maximum range of vision from an approaching locomotive to the washout at approximately 2,000 feet. The engineer stated that he did not observe that the track was undermined until he was within 400 feet of the washed out area.

Circumstances Prior to Accident

Extra 5037 East, an eastbound freight train consisting of four road-switcher type diesel-electric units 5037 (EMD SD-40-2), 5610 (EMD SD-45), 5011 (EMD SD-40), 8763 (GE U-36C), 47 cars and a caboose (2,022 tons), departed San Bernardino, California at 2:57 p.m. on the day of the accident. This train originated at Los Angeles, California and had departed after having received an Initial Terminal Air Brake Test.

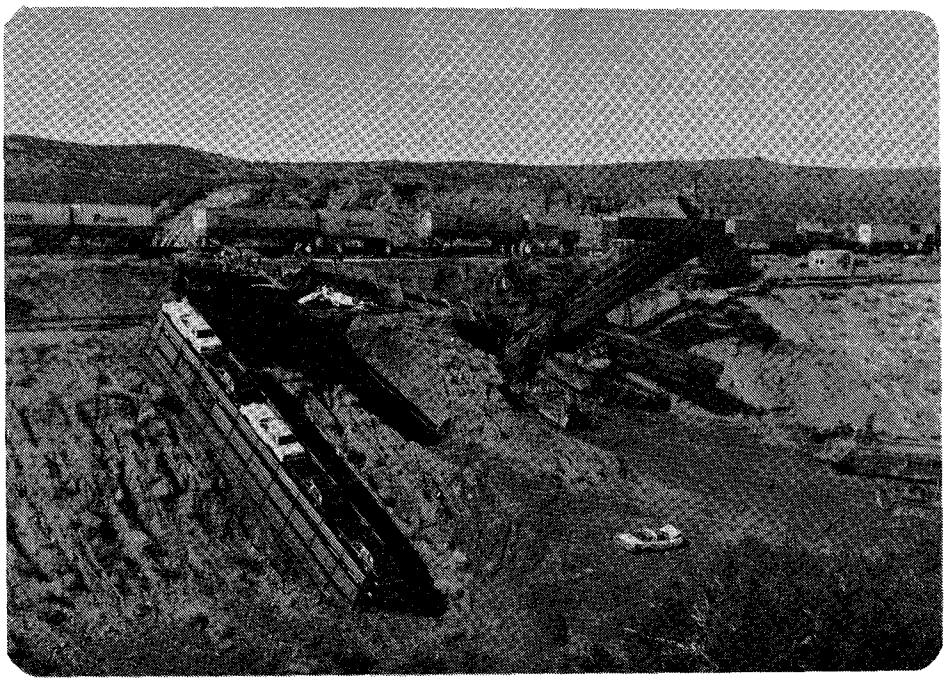
The train proceeded on a 2% ascending grade to Summit where the engineer initiated a running brake test before entering a 0.25% descending grade.

The engineer and front brakeman were in the cab at the front of the first locomotive unit. The engineer was at the controls on the south side of the cab and the front brakeman was seated on the north side of the cab. The conductor and flagman were in the caboose. In addition, two deadheading brakemen were riding in the cab of the second locomotive unit.

The Accident

The train departed Summit at about 4:05 p.m. on the north main track. The last governing signal located 1.5 miles west of the derailment point had indicated proceed. As the train approached the washed out section of track at a speed of 50 m.p.h. the engineer stated that it appeared to him that the track was suspended in mid-air and that the landfill was gone. He further stated the events occurred so fast that he did not have a chance to apply the train brakes. The front brakeman stated that the landfill under the track appeared to be moving as if it was a sea of mud.

Shortly, thereafter, the train enter the washed out area and derailed into the chasm caused by the dislodged track.



The momentum of the train carried the lead locomotive unit across the 95 foot washed out landfill and brought it to rest on the east edge of the area (as shown in the photograph). The three remaining locomotive units and the first six cars fell into the chasm created by the washout and immediately caught fire. The next ten cars were derailed and stopped on or near the track structure.

Post-Accident Examination

Examination of the accident scene disclosed that the impounded water north of the main track eventually penetrated the base of the landfill. That penetration progressed until the binding agents of the landfill could no longer hold the fill together. At that point the landfill collapsed.

A track supervisor inspected the area less than two hours preceding the accident and took no exceptions.

According to weather records maintained at San Bernardino County, there was a total precipitation of 14.70 inches from January 1 through March 6, 1978 in the accident area. Rainfall during this period usually averages 5.05 inches.

Findings

1. At the time of the accident, the AT&SF crew members were engaged in the performance of their duties, in compliance with applicable rules and regulations.

2. Inasmuch as the last governing signal indicated proceed, it is evident the washout failed to damage the track signal circuitry sufficiently to actuate restrictive signal indications.

3. It is apparent that the landfill failure was caused by unusually heavy rainfall, and water being impounded north of the main tracks. This accumulation of water penetrated the base of the landfill and created the washout.

Dated at Washington, D. C., this 23rd day of April 1979
By the Federal Railroad Administration

J. W. Walsh
Chairman
Railroad Safety Board