

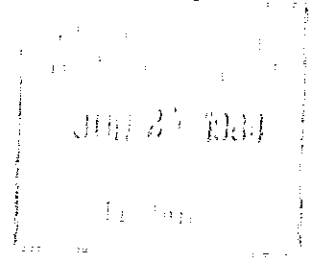
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Department
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Federal Railroad
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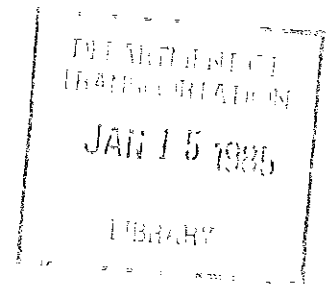
Railroad Accident Investigation Reports

Office of Safety

Report No. 82-1
Bessemer and Lake Erie
Railroad Company
Sherwin, Pennsylvania
January 16, 1982



Report No. 82-2
Louisville and Nashville Railroad Company
Dudley, Alabama
February 3, 1982



FEDERAL RAILROAD ADMINISTRATION

OFFICE OF SAFETY

RAILROAD ACCIDENT INVESTIGATION

ACCIDENT REPORT NO. 82-2

LOUISVILLE AND NASHVILLE RAILROAD COMPANY

DUDLEY, ALABAMA

FEBRUARY 3, 1982

Synopsis

On February 3, 1982, at about 6:20 p.m., a southbound Louisville and Nashville Railroad freight train derailed at Dudley, Alabama. At the time of the accident, the weather was clear.

Casualties

As a result of the derailment, the locomotive engineer and the apprentice engineer were killed. The front brakeman was critically injured.

Cause

The accident was caused by the washing away of the fill under the track.

Location and Method of Operations

The accident occurred on that part of the railroad extending between Bessemer, Alabama, and Tuscaloosa, Alabama, a distance of 43.85 miles. Dudley is located 24 miles south of Bessemer. In the accident area, this is a single track line over which trains operate by timetable, train orders, and a manual block system.

The accident occurred on the main track, 7.25 miles south of Dudley, Alabama.

Track and Terrain

In the accident area, the railroad runs east to west geographically. Timetable direction is north to south. Timetable direction will be the reference in this report.

From the north on the main track, there are, in succession: a tangent of 1,846 feet, a 4-degree curve to the right 890 feet, and a tangent 378 feet to the point of derailment and 229 feet beyond.

The grade for southbound trains in the accident area is 1.0 percent descending.

The main track at the derailment site was laid on an earth fill approximately 450 feet long and about 25 feet high on both sides. The top of the fill varies in width from 15 feet to 30 feet. The fill was constructed of predominantly sandy-clay soil and small sandstone rocks both excavated from nearby hills.

A concrete box culvert, 3 feet by 4 feet and 101 feet long was installed in 1912 and extended perpendicularly through the fill at the derailment point. The original flow line on the inlet end of the culvert was 36 feet; the discharge end was 39 feet below the top of the rails. The culvert was designed to carry water from west to east.

At the point of derailment, a ravine extends slightly upward from the toe of the west slope of the fill to a plateau on the south side and a wooded hillside on the north side. The area southwest of the track at the point of derailment has been surface mined for coal since 1964. This area has recently had soil and contours changed by reclamation. The area east of the track structure has been surface mined since 1975 and similar reclamation of the land was completed about September 1981.

The structure of the main track in the derailment area consists of 100-pound rail, 39 feet long, and laid on an average of 22 crossties per rail length. The 7 1/2- by 10-inch single shoulder tie plates, are spiked to the tie with 2 rail holding spikes per tie plate. The rails are connected with 24-inch joint bars and four bolts. There is an average of eight rail anchors per rail. The ballast depth is about 12 inches below the crossties.

Sight Distance

Range of vision is restricted to about 350 feet by trees along the railroad right-of-way and the walls of a hillside cut. Vision is further limited by a 4-degree curve north of the point of derailment.

Maximum Authorized Speed

The maximum authorized speed for trains in the accident area is 25 mph.

Applicable Rules

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Section 213.33 Drainage.

Each drainage or other water carrying facility under or immediately adjacent to the roadbed must be maintained and kept free of obstruction, to accommodate expected water flow for the area concerned.

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(Code of Federal Regulations, Title 49, Parts 200 to 399, Revised October 1, 1981)

Circumstances Prior to the Accident

Extra 4108 South, consisting of two locomotives, 28 cars, and a caboose, departed Bessemer, Alabama, at about 3:40 p.m. The train brakes were tested by the train crew at Bessemer and functioned properly when used.

The crew performed switching operations at three locations enroute to Holt Junction, Alabama. The last switching operation was performed at Mile Post 419, and the train departed this location at about 5:48 p.m., with two locomotives, seven cars, and a caboose. Shortly before 6:20 p.m., Extra 4108 South passed a 4-degree curve to the right near Mile Post 434.7. The engineer, apprentice engineer, and front brakeman were in the control compartment of the first locomotive. The engineer was operating the train from the right side of the locomotive. The conductor and flagman were in the caboose. Both locomotives had the short hood forward headed south.

The Accident

Extra 4108 South proceeded south from Mile Post 419 to Holt Junction, Alabama. The train was traveling at about 25 mph when the two locomotives and the first three cars dropped into the depression (caused by the failure of the fill) and derailed. (See figures 1 and 2.) As a result of the derailment, the engineer and apprentice engineer were killed, and the front brakeman was critically injured.

Damages

One locomotive and four cars were destroyed. The second locomotive sustained substantial damage.

The carrier's estimates of damages were \$448,000 to equipment and \$68,600 to the track structure including the reconstruction of the fill.

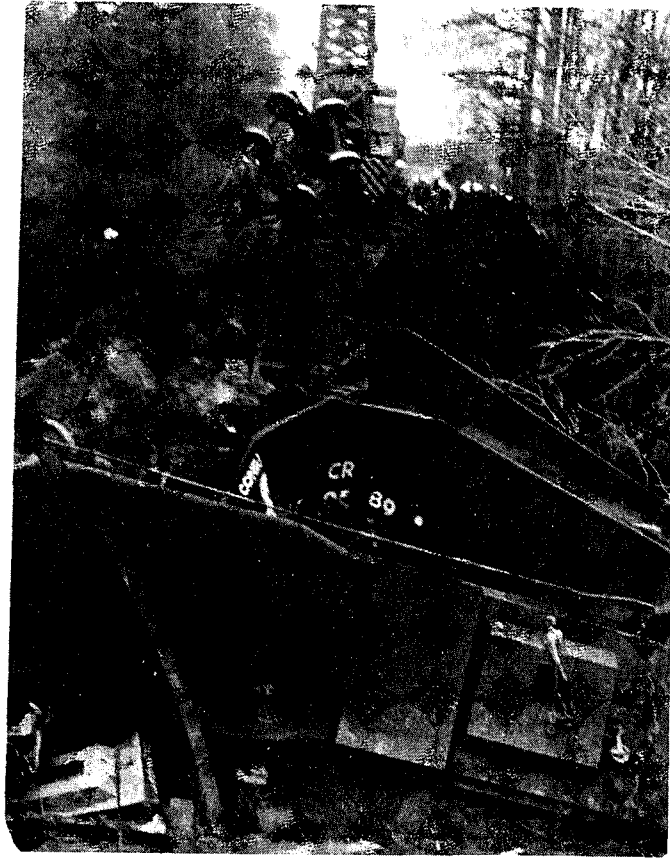


Figure 1. View of accident showing large gap in the fill.



Figure 2. View of accident showing depth of depression.

Post-accident Examination of Equipment

Examination of the control compartment of the first locomotive revealed extensive damage to the control stand and instrument panel. No determinations could be made of the throttle or brake valve positions.

The diesel-electric locomotives were built by the Electro-Motive Division of General Motors Corporation. Gross weight of each was 256,000 pounds. The leading locomotive was equipped with 26-L type air brake equipment.

Post-accident Examination of Track Structure

Examination of the fill disclosed that it was saturated with water in the immediate area of the depression. A section of the fill about 85 feet long, uneven and sloping downward to a depth of about 18 feet below the rails, had been washed out to the east. Sections of the fill on the west, on each side of the depression, had slipped downward. Water was ponding on the west side up to the toe of the fill. This pond of water covered approximately 3/4 of an acre and was about 30 inches deep at the toe of fill.

Examination of the immediate vicinity of the ravine leading to the washout revealed vast amounts of silt and sand from the mine stripping area. The area also showed signs of past and present beaver activity in the ravine. The water had been ponding for some time, holding a level of about 6 to 7 feet below the top of the rails. Examination of the discharge side of the fill showed that the flow line of the ground area was about the same as the inlet side. No culvert or pipe was visible, but water was escaping through the fill.

The box culvert was located about 10 feet below the existing flow line during an inspection conducted on February 9, 1982. Over the years the inlet end was covered by silting and the outlet end was covered by silting and reclamation of land.

Carrier's record show the last inspection of the track in the derailment area was made by the roadmaster on February 1, 1982, and no exceptions were taken to conditions in this area. The carrier's records also indicate that the culvert was last inspected in June 1981 with the condition of the culvert listed as good with a 75-percent-clear opening.

Weather Reports

According to the U. S. National Weather Service Station at Tuscaloosa, Alabama, 12 miles west of the derailment, 2.12 inches of rain fell during the 48 hour period preceding the accident. One person in the vicinity of the derailment, noted that much or most of this rain fell on Tuesday, February 2, between 7 a.m. and 3 p.m. In the 5 days before this accident, there was a total of 2.73 inches of rain.

Findings

1. At the time of the accident, Extra 4108 South was being operated in accordance with the carrier's applicable rules and regulations.

2. Evidence indicates that the fill had washed out prior to the derailment.

3. It is clear that the fill had been saturated for some time, and neglect of the drainage facility caused the fill to fail.

4. Neglect of the inlet end of the drainage facility allowed the outlet end and ditch to become covered over by silting and surface mine reclamation.

5. The carrier's records show an inspection of the culvert in June 1981; however, a proper inspection was not conducted.

6. The drainage facility had been neglected for a number of years.

Dated at Washington, D.C., this 30th
day of July 1982
by the Federal Railroad Administration

J. W. Walsh
Chairman
Railroad Safety Board