

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3426
ATLANTIC COAST LINE RAILROAD COMPANY
IN RE ACCIDENT
NEAR FOUR OAKS, N. C., ON
AUGUST 12, 1951

SUMMARY

Date: August 12, 1951

Railroad: Atlantic Coast Line

Location: Four Oaks, N. C.

Kind of accident: Derailment

Train involved: Passenger

Train number: 2

Engine numbers: Diesel-electric units 520A, 736B
and 529A

Consist: 18 cars

Speed: 46 m. p. h.

Operation: Timetable, train orders and automatic
block-signal system

Tracks: Double; tangent; vertical curve

Weather: Clear

Time: 12:58 a. m.

Casualties: 31 injured

Cause: Displacement of a fill

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3426

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

ATLANTIC COAST LINE RAILROAD COMPANY

October 30, 1951

Accident near Four Oaks, N. C., on August 12, 1951, caused
by the displacement of a fill.

REPORT OF THE COMMISSION¹

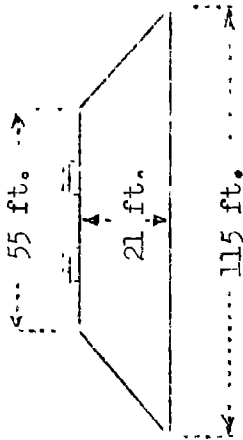
PATTERSON, Commissioner:

On August 12, 1951, there was a derailment of a passenger train on the Atlantic Coast Line Railroad near Four Oaks, N. C., which resulted in the injury of 26 passengers, 1 lounge-car attendant, 1 train porter, 1 Pullman employee and 2 train-service employees.

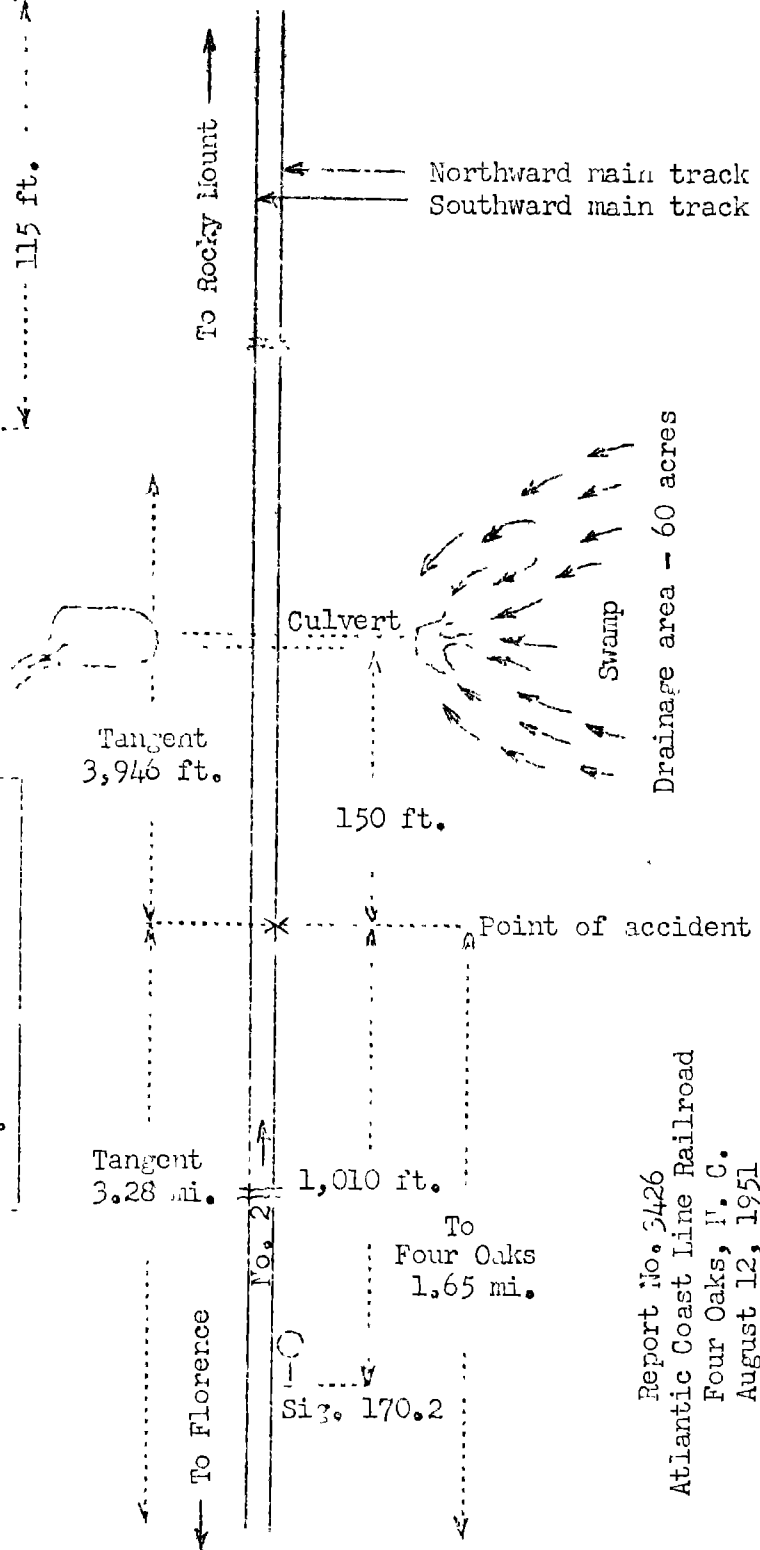
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Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

Cross section of fill at point of accident



- o Rocky Mount, N. C.
- 44.40 mi.
- o Smithfield
- 5.25 mi.
- X Point of accident
- 1.65 mi.
- o Four Oaks
- 14.30 mi.
- o Dunn
- 23.70 mi.
- o Fayetteville, N. C.
- 83.00 mi.
- o Florence, S. C.



Report No. 3426
Atlantic Coast Line Railroad
Four Oaks, N. C.
August 12, 1951

Location of Accident and Method of Operation

This accident occurred on that part of the Northern Division extending between Florence, S. C., and Rocky Mount, N. C., 172.3 miles. In the vicinity of the point of accident this is a double-track line, over which trains moving with the current of traffic are operated by timetable, train orders, and an automatic block-signal system supplemented by an automatic train-stop system. The accident occurred on the northward main track at a point 122.65 miles north of Florence and 1.65 miles north of the station at Four Oaks. The main tracks are tangent throughout a distance of 3.28 miles immediately south of the point of accident and 3,946 feet northward. From the south the grade is 0.61 percent descending northward throughout a distance of 5,100 feet, then there is a vertical curve 1,669 feet to the point of accident and 1,632 feet northward. At the point of accident the grade is practically level.

The track structure consists of 131-pound rail, 39 feet in length, laid new in 1947 on an average of 24 treated ties to the rail length. It is fully tieplated with double-shoulder tieplates, and is spiked with two rail-holding and two anchor spikes per tieplate. It is provided with 6-hole 36-inch joint bars and an average of 10 rail anchors per rail length, and is ballasted with crushed stone to a depth of 9 inches below the bottoms of the ties.

In the immediate vicinity of the point of accident the track is laid on a fill 2,900 feet in length. When the fill was originally constructed in 1886, there was one main track in service on this line. When the second main track was constructed in 1914, the fill was built up on the east side to a top width of 34 feet. Between November, 1950, and June, 1951, the fill was raised approximately 5 feet and widened to a top width of 55 feet. The material of the original portion of the fill consists of a mixture of clay, sand, and gravel. Similar material was used in widening the fill. The derailment occurred 1,468 feet north of the south end of the fill. At this point the fill is approximately 115 feet wide at the bottom and 21 feet high.

The only culvert under the fill is located 150 feet north of the point of accident. This culvert is about 130 feet long and varies from 6 to 7 feet in diameter. The flow line of the culvert is slightly below the bottom of the fill, which is about 4-1/2 feet lower at the culvert than it is at the point of accident. Water from an area of approximately 60 acres east of the tracks drains through this culvert to the west side of the tracks.

Automatic signal 170.2, governing north-bound movements on the northward main track, is located 1,010 feet south of the point of accident.

The maximum authorized speed for the train involved was 90 miles per hour, but it was restricted to 50 miles per hour in the vicinity of the point of accident.

Description of Accident

No. 2, a north-bound first-class passenger train, consisted of Diesel-electric units 520A, 756B and 529A, coupled in multiple-unit control, one baggage-dormitory car, one chair car, four sleeping cars, two dining cars, nine chair cars, and one tavern-observation car, in the order named. The first car was of conventional all-steel construction, and the other cars were of lightweight steel construction. All units of the train except the first car were equipped with tightlock couplers. This train departed from Florence at 10:47 p. m., August 11, 22 minutes late, passed Dunn, the last open office, 15.95 miles south of the point of accident, at 12:37 a. m., 36 minutes late, passed signal 170.2, which indicated Proceed, and while moving at a speed of 46 miles per hour the rear truck of the fifth car, the rear truck of the sixth car, and the seventh to the twelfth cars, inclusive, were derailed at a point 1.65 miles north of the station at Four Oaks.

Separations occurred between the third Diesel-electric unit and the first car, between the seventh and the eighth cars, and between the eighth and the ninth cars. The Diesel-electric units stopped with the front of the first unit 1,472 feet north of the point of derailment. The first seven cars stopped with the front end of the first car 422 feet south of the third Diesel-electric unit. The fifth, sixth, and seventh cars stopped approximately in line with the track. They leaned to the right at angles of 15 degrees, 30 degrees, and 30 degrees, respectively. The eighth car stopped on its right side with the front end across the northward main track and 43 feet south of the rear end of the seventh car, and the rear end 62 feet east of the track. The ninth car stopped upright at the toe of the fill, parallel to the tracks, with the front end against the rear end of the eighth car. The tenth car stopped at an angle of 45 degrees to the track, with its rear end on the track structure. It leaned to the right at an angle of 40 degrees. The eleventh and twelfth cars stopped approximately in line with the track. They leaned to the right at angles of 15 degrees and 30 degrees, respectively. The seventh to the eleventh cars, inclusive, were badly damaged, the twelfth car was somewhat damaged, and the fifth, sixth, thirteenth, and fourteenth cars were slightly damaged.

The conductor and the train porter were injured.

The weather was clear at the time of the accident, which occurred about 12:58 a. m.

Discussion

As No. 2 was approaching the point where the accident occurred the enginemen were maintaining a lookout ahead from the control compartment at the front of the first Diesel-electric unit. The members of the train crew were in various locations in the cars of the train. The speed was 46 miles per hour, as indicated by the tape of the speed recording device. The headlight and the oscillating signal light were lighted brightly. The brakes of the train had been tested and had functioned properly when used en route. Automatic signal 170.2 indicated Proceed. The locomotive and the cars were riding smoothly, and the track ahead appeared to be in normal alinement. The enginemen said that there was no unusual movement of the locomotive as it passed the point where the accident occurred, but immediately afterward the brakes were applied in emergency as a result of the derailment.

Examination of the track after the accident occurred disclosed that between points 78 feet and 214 feet south of the culvert a portion of the material in the east side of the fill had become displaced. The displaced material had moved eastward at the toe of the fill a maximum distance of about 15 feet, and the top surface of the fill had subsided a maximum distance of 13 feet. At its maximum width, the depression in the top surface extended to the west rail of the northward main track. From the south the northward main track was in normal surface and alinement to a point 251 feet south of the culvert. North of this point the track was shifted to the east throughout a distance of about 120 feet and was destroyed throughout a distance of 495 feet farther northward. The portion of the fill under the southward main track was not disturbed.

Apparently water had seeped from the top into the portion of the fill constructed in 1914 and had become impounded. The investigation disclosed that some of the material of the fill is capable of absorbing water up to about 50 percent of its volume. When saturated, this material becomes semi-fluid and has very little cohesion. Evidently the impounding of the water had occurred over a considerable period of time and had caused internal pressure within the fill to build up gradually to the degree at which the additional pressure caused by the weight of the train caused the fill to give way suddenly.

Inspection after the accident occurred disclosed that the culvert had not been full of water. The top of the culvert is below the level of that part of the fill which was displaced, and water could not have seeped from the culvert to the point where it became impounded in the fill.

According to information furnished by the U. S. Weather Bureau station at Smithfield, 5.25 miles north of the point of accident, 2.94 inches of rain fell during the 10-day period ending at 8 a. m. on the day of the accident. Of this rainfall, 2.18 inches fell between 3 p. m., August 10, and 8 a. m., August 11, and .04 inch fell between 8 a. m., August 11, and 8 a. m., August 12.

The general roadmaster in charge of track maintenance in this territory said that he had no knowledge of any previous failure of the fill on which this accident occurred. The section foreman said that he had experienced no difficulty in maintaining the cross level and alignment of the tracks on the fill. He inspected the toe of the fill on August 6 and inspected the fill from the roadbed on August 9. No defective condition was observed. The roadmaster passed over the fill several times August 10, both by train and by track motor-car, and did not observe any defective condition. A north-bound passenger train passed over the fill about 1 hour 40 minutes before the accident occurred. The members of the crew noticed no unusual condition of the track or fill.

Cause

It is found that this accident was caused by the displacement of a fill.

Dated at Washington, D. C., this thirtieth day of October, 1951.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.