BUREAU OF SAFETY

REPORT NO. 1959

Railroad:	Southern
Date:	January 5, 1935
Location:	Edwardsville, Ala.
Kind of accident:	Derailment
Train involved:	Freight
Casualties:	3 killed
Cause:	Rock slide

1959

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE SOUTHERN RAILWAY NEAR EDWARDSVILLE, ALABAMA, ON JANUARY 5, 1935.

February 16, 1935.

To the Commission:

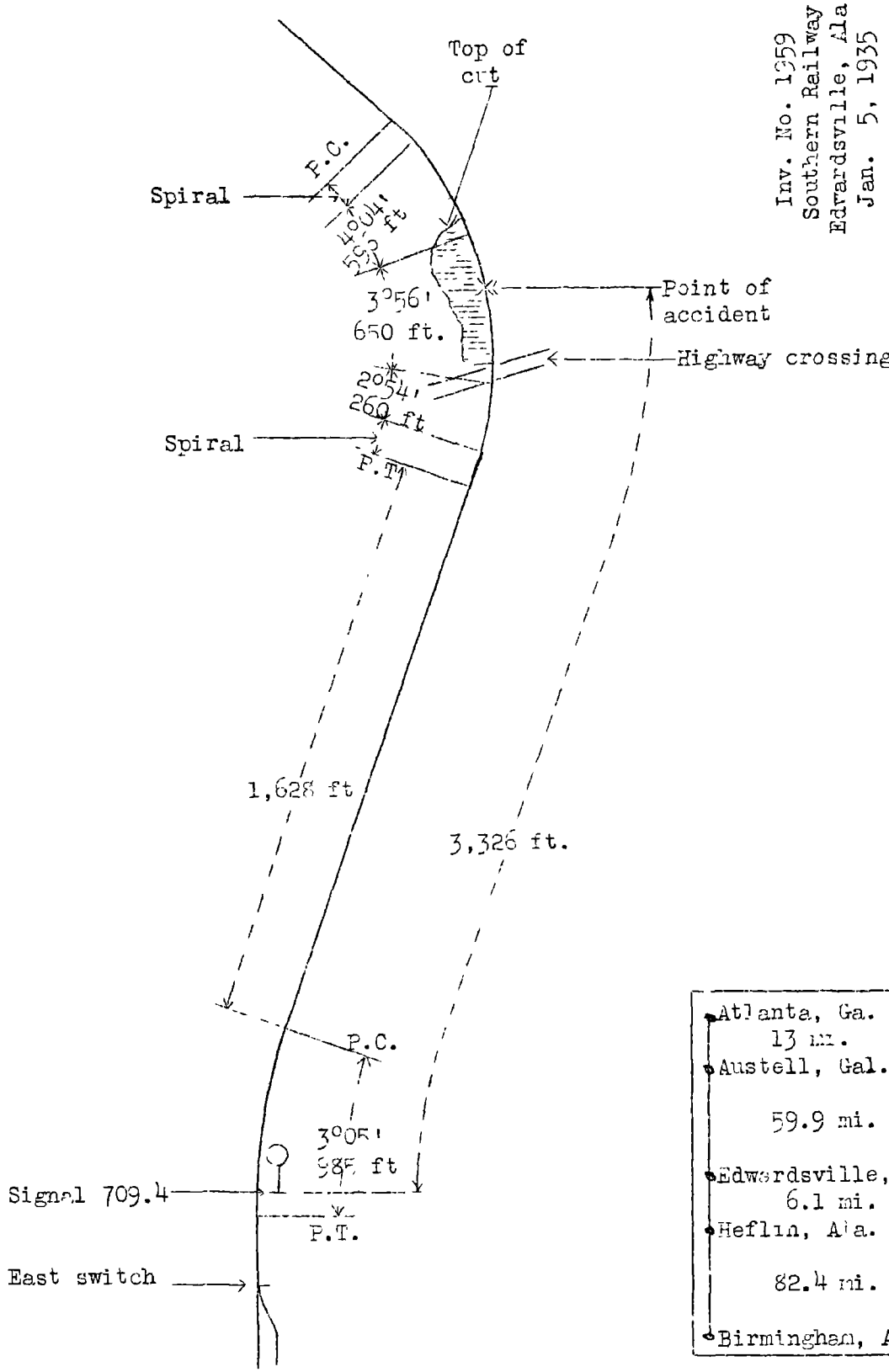
On January 5, 1935, there was a derailment of a freight train on the Southern Railway near Edwardsville, Ala., which resulted in the death of 2 employees.

Location and method of operation

This accident occurred on that part of the Birmingham Division extending between Birmingham, Ala., and Austell, near Atlanta, Ga., a distance of 148.4 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time table, train orders, and an automatic block-signal system, supplemented by an automatic train-stop device of the intermittent-inductive type. The point of derailment was approximately 3,914 feet east of the east passing-track switch at Edwardsville; approaching this point from the west, there is tangent track for 1,628 feet, followed by a compound curve to the left consisting of 240 feet of spiral, a curve of 2°59' for a distance of 260 feet, 3°56' for 650 feet, 4°04' for 596 feet, and spiral for 300 feet, the accident occurring on the 3°56' curve 229.9 feet from its leaving end. The grade is generally ascending for east-bound trains, varying from 0.16 to 1.67 percent, and is 1.405 percent at point of accident. The track is laid with 100-pound rails, 39 feet in length, with an average of 24 ties to the rail length, tieplated, and ballasted with slag to a depth of about 8 feet; the track is well maintained.

Approaching the point of accident from the west, the track is laid in a side-hill cut, with the bank to the north and fill to the south; the wall of the side cut varies in height up to about 21 feet above the tops of the rails and the fill varies from grade to about 20 feet below the rails. The face of the slope is precipitous.

Inv. No. 1359
Southern Railway
Edwardsville, Ala.
Jan. 5, 1935



Owing to the curve and also to the bank on the north or inside of the curve, the view from the fireman's side of the engine was restricted to about 350 feet. The last automatic block signal passed by the train involved in this accident was east-bound signal 709.4, located 3,326 feet west of the point of accident.

The weather was cloudy at the time of the accident, which occurred at 13:10 p.m.

Description

Train No. 54, an east-bound freight train, consisted of 86 cars and a caboose, hauled by engine 4773, and was in charge of Conductor Herrin and Engineman Strange. This train left Heflin, Ala., at 11:52 a.m., according to the train sheet, 1 hour and 32 minutes late, passed Edwardsville, and was traveling at a speed estimated to have been about 30 miles per hour when it was derailed by rock and earth that had fallen on the track.

Engine 4773, its tender, and the first six cars in the train were derailed; the engine stopped in an upright position, leaning against the side wall of the cut to the right, the tender remained upright and stopped diagonally across the track; the first five cars were across the track between the walls of the cut and the sixth car was under the fifth car, the body having been destroyed. The employees killed were the engineman and head brakeman.

Summary of evidence.

Fireman McWhorter stated that after leaving Heflin he was sitting on the brakeman's seat looking ahead while the brakeman was firing the engine. At Edwardsville, automatic block-signal 709.4 was displaying a clear indication but about a quarter of a mile east of the east switch there was a caution signal indicating that men were working on the track ahead; he called this signal to Engineman Strange who repeated it and then sounded a crossing signal for the highway crossing located near the west end of the cut. As the engine was passing over the crossing Fireman McWhorter saw the slide of dirt across the track and called to the engineman to stop, whereupon the brakes were applied in emergency and the throttle closed. It was the fireman's opinion that in order to be under control at the point where the section men were working, which was east of the point of accident, the engine would have been shut off about where it stopped after derailment. He said the engine was in good condition, and the brakes had been tested properly and worked well en route.

Conductor Herrin and Flagman Finley were in the caboose and estimated the speed of the train to have been about 30 miles per hour just before the brakes were applied in emergency.

Engineman Day, of Train No. 25, a west-bound passenger train, stated that about 11:39 or 11:40 a.m., his train passed through the cut where the accident occurred and he noticed no unusual condition; he could not recall any slides previously in this vicinity.

At 7:30 a.m. on the day of the accident, Section Foreman Owens, who has charge of the section on which the slide occurred, looked at the side walls of the cut as he passed through on his motor car. On this day he was surfacing the track $\frac{1}{2}$ mile east of the point of accident and had placed a caution signal about 50 feet west of the road crossing, indicating that men were working on the track ahead. The first indication of anything wrong was when he heard escaping steam and on hurrying to the scene he discovered that the derailment was caused by a slide of rock and earth from the north side of the cut near the west end. The last regular inspection of the cut was on December 31, and at that time he found no cracks or loose rocks.

Division Superintendent Payne stated that he passed through this cut on January 3, accompanied by Roadmaster Moore and several supervisors of track and section foremen, and he was certain there was no indication of a slide at that time. He arrived at the scene of accident about 3:15 p.m., and after examination he estimated that between 60 and 80 cubic yards of soil and rock had fallen on the track, covering the north rail to a depth of 4 or 5 feet and the south rail 3 or 4 feet. He was unable to determine the cause of the slide. Roadmaster Moore said there was no indication that the slide had disturbed the track, and Track Supervisor Lawler said that in 42 years of service he did not recall a previous slide in this vicinity; he had last inspected the cut on December 27.

Signal Supervisor Brown stated that the rails in this track clear the slag ballast 1 inch, the material which had fallen on the track was loose and being of high resistance it did not shunt the track circuit, the signal remaining clear.

In a letter to the assistant to the chief engineer of the Southern Railway dated January 23, the following statements were made by Mr. Stewart J. Lloyd, geologist for Geological Survey of Alabama:

"The rock underlying this area and showing along the the cut is essentially a "sericitic phyllite" of Talladega age. Sericite is a form of mica, and the chief character-

istic of a phyllite is its property of splitting into thin sheets like a slate, but without the evenness and flat surfaces of a slate. The Talladega series of rocks is one of our very old and much metamorphosed formations. The phyllite here has the same composition(chemical) as a sandy shale, while more severe metamorphism would have altered it into a mica schist.

"This rock is not massive in the sense that granite is, but shows pronounced cleavage planes, and is often foliated like the leaves of a book. In the cut it is dipping to the southeast at an angle of 20-25°, in conformity with the regional structure."

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"The rock displacement in the cut was not a slide in the usual sense of the word. The rock did not slide along cleavage planes into the cut, in a southeast direction, but broke off almost at right angles to the dip. A close examination of the surface left by the break showed that the rock had broken off somewhat unevenly along a joint plane running parallel to the dip. Some iron sulfide (pyrite) and its decomposition product iron sulfate were in evidence along the surface of the break, as well as aluminum sulfate. Evidently the iron sulfide occurring close to or in the joint plane had weathered, producing acid material which in passing down the plane during wet weather had eaten away the connecting links between the block which fell, and the rest of the cliff. That there had been considerable circulation along this plane is shown by the coating of black manganese oxide.

"Iron sulfide occurs here and there throughout this general series of rocks, usually not much in one place. It weathers very rapidly when exposed alternately to air and to moisture.

"I do not think there is any reason to expect normal slides in these cuts, but the possibility of blocks breaking off sideways as this one did, and for similar reasons, cannot be dismissed. Certainly the north side of this cut, the western half of it at least, should be scaled back somewhat, and similar cuts in similar country, between Tallapoosa, Georgia, and a point some five miles west of Heflin, should have their northern sides carefully examined in view of similar possibilities."

The Commission's inspectors were advised by Mr. Tobien, assistant to the chief engineer, under date of February 8, that work had begun on scaling the north side of the cut.

Conclusions

This accident was caused by earth and rock which had fallen on the track from the side of a rocky cut through which the track passed.

The investigation developed that about 70 cubic yards of earth and rock became dislodged and fell on the track, covering the rails to a depth varying from 3 to 5 feet. This occurred less than 30 minutes prior to the accident, for a west-bound train passed through the cut about 11:40 a.m. and at that time the members of the crew of that train noticed nothing wrong. the indications were that the track circuit controlling the automatic block signals was not disturbed and therefore the engine crew received no warning of danger when passing the last signal, while the curve and side hill limited the view from the fireman's side of the cab to a very short distance; apparently the members of the engine crew were on the alert, the fireman calling a warning as soon as the obstruction came within his range of vision, but too late to avoid the accident.

The report of a geologist stated that this was not a slide in the usual sense of the word; the rock did not slide along cleavage planes but broke off almost at right angles to the dip of the formation, along a joint plane running parallel to the dip. Apparently iron sulfide occurring close to or in the joint plane had weathered, producing acid material which in passing down the plane during wet weather had eaten away the connecting links between the block which fell and the rest of the cliff. The geologist pointed out that there was a possibility of other rocks breaking off in a similar manner, and for the same reasons, and stated that the north side of the cut should be scaled back, and the Commission's representatives were advised that the work of scaling back the side of the cut was already under way.

Respectfully submitted,

W. J. PATTERSON

Director.