

BUREAU OF SAFETY

REPORT NO. 1972

Railroad: Clinchfield
Date: March 20, 1935
Location: Toecane, N. C.
Kind of accident: Derailment
Train involved: Freight
Train number: Extra 732
Consist: 71 cars
Speed: 25-35 m.p.h.
Track: Compound curve varying from 2° to 8°,
accident occurring on 6°30' portion.
Track on fill paralleling east bank of
Toe River, with Blue Ridge Mountains
rising abruptly from east side of road
bed to height of about 1,800 feet.
Mountainside consisted of clay and
large boulders.
Weather: Clear
View: Extremely limited due to curvature and
darkness; accident occurred at 7:45 p.m.
Casualties: 1 killed and 2 injured
Cause: Land and rock slide

1972

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE CLINCHFIELD RAILROAD NEAR TOECANE, N.C.,
ON MARCH 20, 1935.

May 7, 1935.

To the Commission:

On March 20, 1935, there was a derailment of a freight train on the Clinchfield Railroad near Toecane, N. C., which resulted in the death of 1 employee and the injury of 2 employees.

Location and method of operation

This accident occurred on that part of the Clinchfield Railroad which extends between Spartanburg, S. C., and Erwin, Tenn., a distance of 141 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by time table and train orders, no block-signal system being in use. The accident occurred at a point 0.65 mile north of the station at Toecane. Approaching this point from the south there are several short curves and tangents followed by a compound curve to the left 1,962.1 feet in length, this curve consisting of a 1° curve for a distance of 480.3 feet, 2° for 413.7 feet, and 8° for 288.3 feet, $6^{\circ}30'$ for 463 feet and 8° for 286.8 feet, the accident occurring on the $6^{\circ}30'$ portion of the curve at a point about 105 feet from its northern end. The grade for north-bound trains is generally descending for approximately 1 mile to the point of accident, varying from 0.08 to a maximum of 0.58 percent at the point of accident.

The track is laid with 130-pound rails, 39 feet in length, with 22 ties to the rail length, ballasted with stone and is well maintained. In the vicinity of the point of accident the track is laid on a fill paralleling the east bank of the Toe River. Pumpkin Patch Mountain, of the Blue Ridge Range, rises abruptly from the east side of the road bed to a height of approximately 1,800 feet above Toe River. The mountainside is of clay formation with large boulders embedded in it, underlaid by solid rock. The face of the slope is precipitous.

Due to the curve the view had by the engineman of the track ahead was entirely obscured and the view had by the fireman at night was limited to a very short distance.

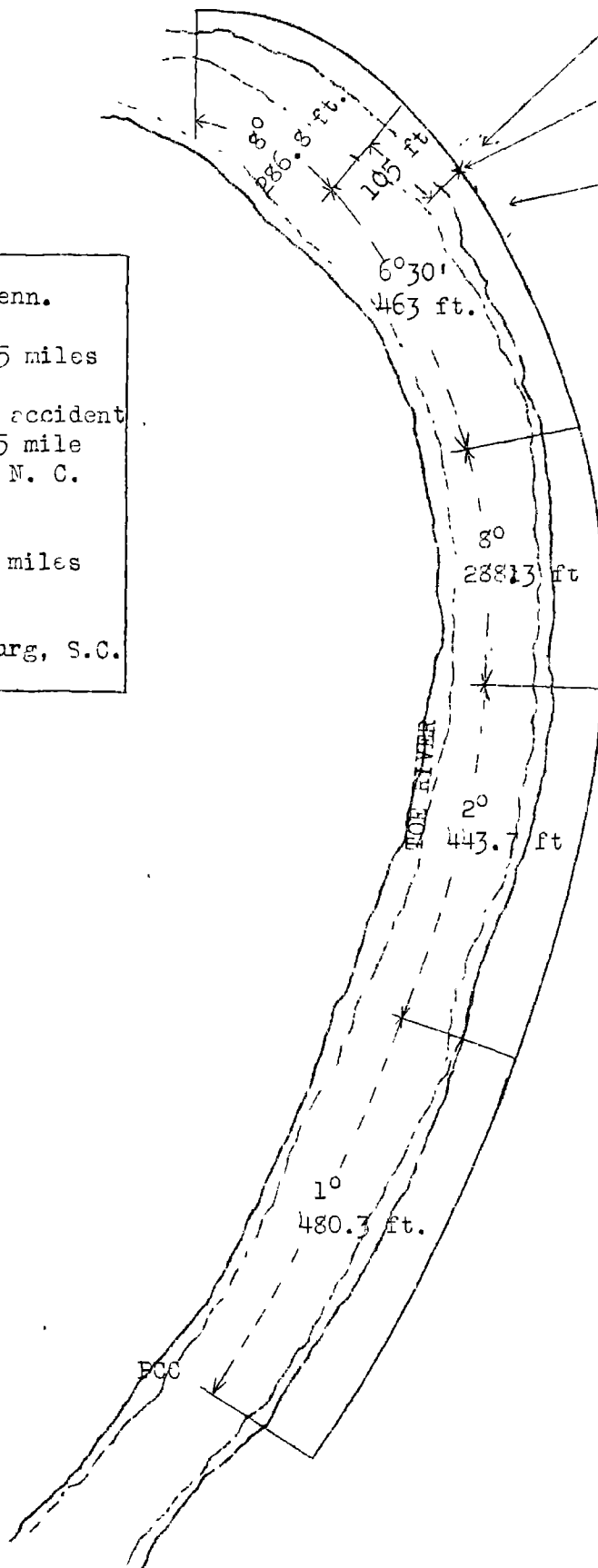
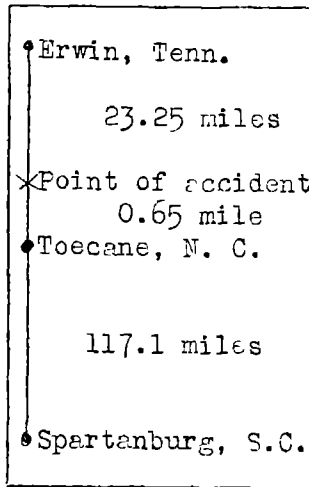
The weather was clear and it was dark at the time of the accident, which occurred at 7:45 p.m.

-2-

Area of slide starting
41 feet above track

Point of accident

Portion of slope scaled
on March 18, 19 and 20.



Inv. No. 1972
Clinchfield Railroad
Toecane, N. C.
March 20, 1935

Description

Extra 732, a north-bound freight train, consisted of 21 loaded and 49 empty cars and a caboose, hauled by engine 732, of the 2-8-8-2 type, and was in charge of Conductor Burton and Engineman Fox. At Marion, 52 miles south of Toecane, the crew received a copy of train order 235, form 19, directing them to observe rule 105(a) which reads:

During storms and bad weather, all trains must be handled under control, without regard to making schedule time, at all points where slides or washouts are liable to be encountered.

This train departed from Altapass, the last open office, 20.5 miles south of Toecane, at 6:40 p.m., according to the train sheet, and shortly after passing the station at Toecane was derailed on encountering rock and earth on the track while traveling at a speed estimated to have been from 25 to 35 miles per hour.

The engine was derailed to the left and stopped at the foot of the embankment 17½ feet below the level of the track, leaning at an angle of 45° to the right, with the front end buried in mud at the edge of the river. The tender followed the engine down the embankment and the first eight cars were piled up within a short distance between the river and the mountainside and were destroyed. The fifty-second and fifty-third cars were telescoped but remained on the road bed. The employee killed was the fireman and the employees injured were the engineman and head brakeman.

Summary of evidence

Engineman Fox stated that the throttle was closed and the train was drifting at a speed of about 25 miles per hour when he heard something strike; he leaned out, saw fire flying and thought the engine had struck rock. He had his hand on the brake valve at the time and thought he applied the air brakes, although the engine truck is equipped with a device which operates to cause an emergency application of the brakes when the engine truck wheels become derailed and this device may have operated to apply the brakes. He did not receive any warning from either the fireman or the head brakeman; on passing Toecane he looked over and saw that they both were in their respective places in the cab. The headlight was burning but he did not think that the range of vision on the fireman's side at night would be more than 50 feet and was not certain that the fireman could see even that distance. Engineman Fox had received the train order which directed him to observe rule 105(a) and, while

he had heard there had been heavy rains between Toecane and Erwin, he had not encountered any rain during the entire day, nor did he find any unusual condition such as water in ditches or water coming down out of the banks. Before leaving Spartanburg the air brakes had been tested and they functioned properly en route, but the brakes were not tested on 10 cars added to his train at Spruce Pine.

Head Brakeman Davis stated that he was riding on the brakeman's seat immediately ahead of the fireman. Looking ahead he observed a fire by the side of the roadway, to which he called the fireman's attention, and decided it was old ties which were being burned. About the time they passed the fire he looked ahead and saw a slide on the track when the engine was not more than 10 feet from it, and he did not have time to warn the engineman. He did not think he could have seen the slide for more than 60 or 75 feet.

Conductor Burton stated that as his train ascended Blue Ridge he observed indications of previous rain and at Spruce Pine he noticed a little water in the drainage ditch but nothing unusual; the weather had been clear all day. After the accident he found the track torn up but there was enough earth on the road bed to indicate that prior to the derailment the track had been covered by earth and rock; there were several large rocks on the track and down the embankment.

Flagman Senter estimated the speed of the train at the time of the accident to have been between 30 and 35 miles per hour.

Section Foreman Johnson stated that at about 5 p.m. on the day of the accident he left the vicinity of the point of accident and there was no indication of a dangerous condition at that time. Within two weeks prior to the occurrence of the accident there had been several showers but no unusual storm; water had come down over the rocks from the highway above the point where the slide occurred, and while the ground had been softened he did not think that the rainfall had anything to do with the cause of the accident.

Roadmaster Brown stated that on his arrival at the scene of the accident at about 10:45 p.m. he found there had been a land and rock slide consisting of about 40 or 50 cubic yards. Apparently the track had been pushed out of line and the east rail had been covered to a depth of about $3\frac{1}{2}$ feet; there were several large boulders on the track and roadbed ranging in size from 1,000 pounds to 2 tons. The cavity left by the slide measured about 5 feet at its deepest point, from 18 to 20 feet in width at the bottom, running back to the top in a V-shape. Roadmaster Brown stated that on January 25 a freight train struck a small rock about 300 feet south of the point of accident, causing slight damage to the engine, and on March 12

a passenger train struck a boulder in this vicinity, damaging the pilot of the engine. The slope at that point then was examined and steps were taken to remove all hanging or loose rock. On March 18 about 800 tons of rock were removed from the slope, and while this work was in progress an unsuccessful attempt was made to remove a large rock a few feet south of the location of the slide which caused this accident; a $1\frac{1}{2}$ inch steel cable attached to the rock and pulled by the derrick was broken, but the rock was not disturbed. Roadmaster Brown did not think that the efforts to dislodge that rock loosened the rock and earth immediately north thereof and indirectly caused the slide. No hazardous condition existed when this work was completed about 5 p.m. on March 18 and there was no evidence of unusual flow of water at that time. His forces also were employed at that point on March 19 and 20 until 5 p.m. removing earth from the ditch line, and a watchman had been on duty to precede and protect all trains in that vicinity from 4 p.m. March 19 to 7 a.m. March 20. He considered, however, that neither the weather conditions nor the condition of the slope were such as to require the services of a watchman on the evening of March 20. Roadmaster Brown further stated that he knew of no further precaution which might be taken by operating officers to prevent similar accidents, and he had no assurance that a similar accident might not occur at any time in the vicinity of the point of accident. Some large boulders back of the highway, situated 200 feet above the track, may become dislodged at any time. He stated that the formation of the slope which exists in the vicinity of the point of accident extends to Forbes, a distance of about 3 miles and is not found elsewhere along this railroad. Roadmaster Brown further stated that at 6:15 p.m. on March 25, five days after the occurrence of this accident, another slide occurred at the same place as a result of heavy rains throughout the day and the track was blocked until 10:30 p.m.; this slide consisted of from 4 to 6 yards of rock and mud.

Superintendent McIntyre stated that he had passed the point of accident with Roadmaster Brown about 2:15 p.m. on the afternoon of the accident; the section foreman rode with them from Toecane to Forbes and was instructed to return to the point he had been scaling, take down a few small rocks and do some additional scaling that afternoon. In this particular territory the rainfall is heavy and frequent showers occur that fill the ditches. One of these showers had occurred on the morning of the date of accident, but at the time he passed that point the weather was clear and the ditches were practically free of water; there was no indication that there was anything unusual as a result of rainfall that had occurred. Superintendent McIntyre was of the opinion, after inspection at the scene of the accident, that the track had been knocked out of line toward the river and that the engine had not struck the body of the slide full force,

but had been deflected toward the river, otherwise he believed it would have turned on its side rather than have landed practically upright at the foot of the fill. On the morning following the accident he made a careful inspection of drainage conditions on the highway above the track, and could find no evidence of drainage into the bank at the point of the slide. The highway at that point was on a grade of approximately 1 percent and well ditched on the back side, water running to a drainage channel some distance south of the point of slide; there is also a drainage channel about 100 feet north of the point of slide that carries the water down the hill and underneath the track. This entire mountainside is made up of loose boulders and earth formation so far as can be seen so that it is impossible to scale and get down all of the material that might appear to be dangerous. It is watched carefully and wherever there is an indication of danger, the dangerous rock is removed.

Engineman Daniels, of pusher engine 735, stated that he passed Toecane, north-bound, at 6:15 p.m.; it was not yet dark and the vision was good. His speed was about 6 miles per hour on passing the point where the slide later occurred. He observed that the ground was wet but there was no indication of insufficient drainage and the track was free of rocks. There was no unusual condition of weather, quantity of water nor any other apparently dangerous condition in that vicinity. The statements of Engineman Richardson, of engine 417, which was coupled to engine 735, corroborated those of Engineman Daniels.

Discussion

The slide consisted of from 40 to 50 cubic yards of earth and rock which was dislodged from an irregular cavity about 5 feet deep, 20 feet wide at the base and about 10 feet wide at the top, the top portion being about 40 feet above the track. The indications were that the track had been pushed out of line and that the east or right rail was covered to a depth of about $3\frac{1}{2}$ feet. A north-bound train had passed through this territory about $1\frac{1}{2}$ hours prior to the occurrence of the accident, at which time there was no evidence of anything wrong.

Three accidents, including the one here under investigation, have occurred in this vicinity due to slides within a period of two months. The first was due to a small rock on the track on January 25th, the second was caused by a boulder on the track on March 12, and as a result this slope was scaled and about 800 tons of rock were removed from the territory just south of the location of the slide causing this accident, this work having been done during the three days prior to the occurrence of the accident. On March 25, while the investigation of this accident was in progress, another slide occurred at the same point; the track was blocked for several hours and traffic obstructed, but no train accident resulted. This mountainside is of clay

formation with large round boulders embedded in it, underlaid by solid rock, and many heavy showers occur in this territory. There had been a shower on the morning of the day of the accident, but in the afternoon when officials of the railroad passed through this territory the ditches were practically free of water and there was no indication of any dangerous condition existing at that time. The operating officials state that while effort is being made to provide for safe operation of trains at this point, there is no assurance that a similar accident may not occur at any time.

Conclusions

This accident was caused by a land and rock slide.

It is recommended that immediate consideration be given by this carrier to patrol of tracks by watchmen, the installation of slide detector fences or some other means of protecting trains against the danger of slides in this vicinity.

Respectfully submitted,

W. J. PATTERSON,

Director.