

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE DENVER AND RIO GRANDE WESTERN RAILROAD
NEAR CAMEO, COLO., ON AUGUST 31, 1935.

October 9, 1935.

To the Commission:

On August 31, 1935, there was a derailment of a freight train on the Denver and Rio Grande Western Railroad near Cameo, Colo., which resulted in the death of 1 employee and the injury of 1 employee.

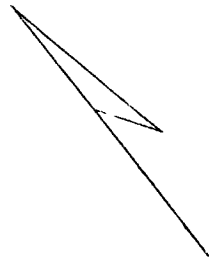
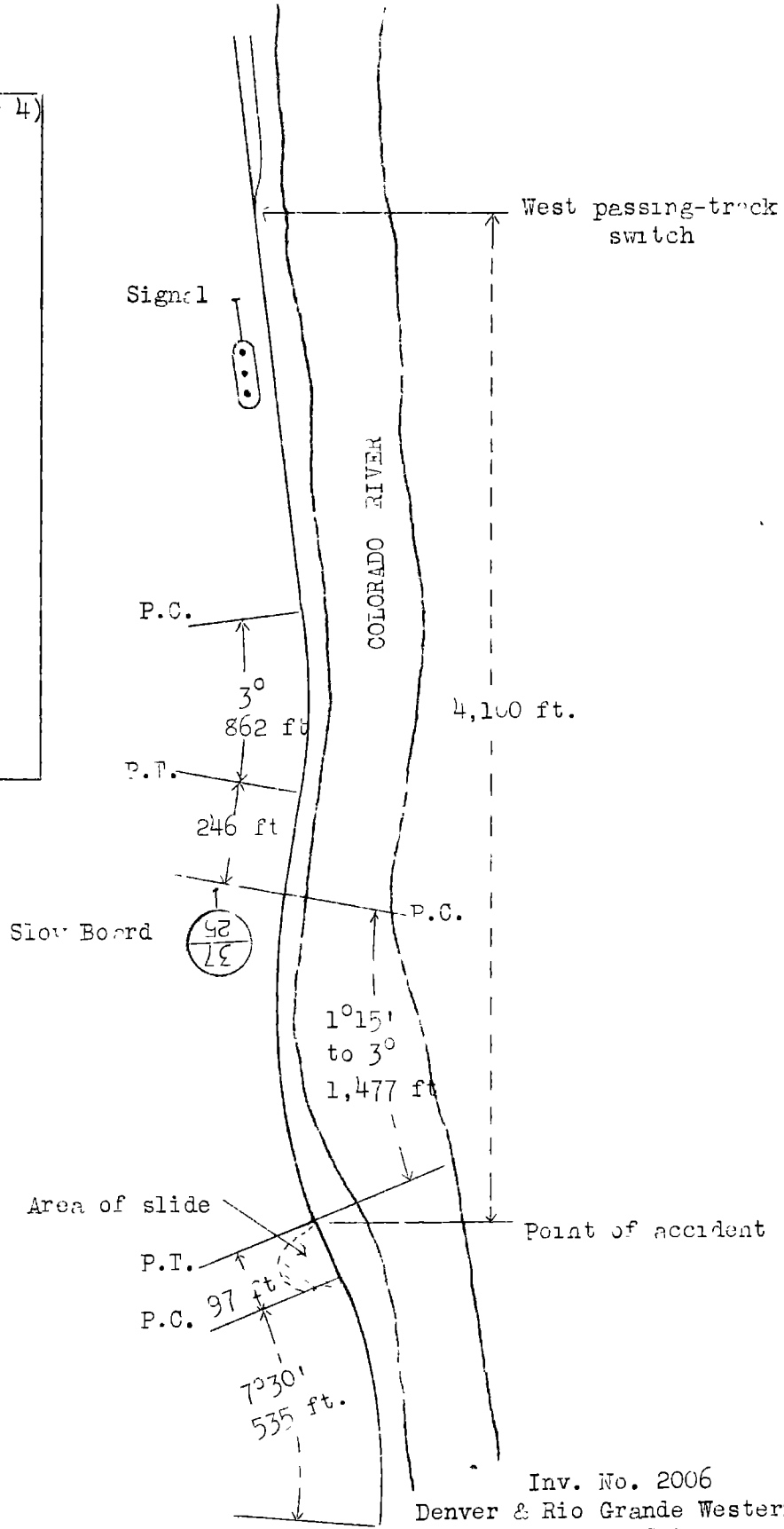
Location and method of operation

This accident occurred on Sub-division 4 of the Grand Junction Division, which extends between Minturn and Grand Junction, Colo., a distance of 147.6 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. The accident occurred at a point approximately 4,100 feet west of the west passing-track switch at Cameo; approaching this point from the east, there is a 5° curve to the right 862 feet in length, tangent track for a distance of 246 feet, a compound curve to the left 1,477 feet in length, varying in curvature from $1^{\circ} 15'$ to 3° , and then 97 feet of tangent track, the accident occurring at the eastern end of this latter tangent. The grade for west-bound trains is 0.4 percent descending at the point of accident. A permanent slow board is located approximately 1,300 feet east of the point of accident, the speed of freight trains being restricted to 25 miles per hour.

The west-bound automatic signal, of the color-light type, governing movements within the block in which this accident occurred, is located approximately 200 feet west of the west passing-track switch, or 3,900 feet east of the point of accident.

The track is laid with 90-pound rails, 39 feet in length, with an average of 24 ties to the rail-length, single-spiked, fully tieplated, and ballasted with furnace slag to a depth of about 8 inches; the track is well maintained. The accident occurred within the territory known as Adobe Cut, the track being laid on the side of a bluff which borders it on the north while on the south side the Colorado River is approximately 25 feet below the track. The earth formation through this section in general is either shale, granite, sandstone or adobe, and in some places rises perpendicularly for several hundred feet. In the

• Minturn, Colo. (Sub-Div 4)
111 mi.
• Niger
3.6 mi.
• DeBeque
16 mi.
• Cameo
* Point of accident
17 mi.
• Grand Jct. (Sub-Div. 5)
23.5 mi.
• Ruby
153.4 mi.
• Helper, Colo.



Inv. No. 2006
 Denver & Rio Grande Western RR
 Cameo, Colo.
 August 31, 1935.

immediate vicinity of the point of accident the formation is adobe with large and small rocks imbedded in it. This formation begins approximately 1,000 feet east of the point of accident and consists of a wall which is perpendicular for a short distance and slopes back gradually to the top of the bluff. This adobe formation is generally rather hard and has to be broken up by explosives. However, constant erosion takes place, and dust and small rocks and pebbles frequently fall, with an occasional slide bringing down large rocks and boulders.

It was clear and dark at the time of the accident, which occurred at 12:26 a.m.

Description

Extra 1707, a west-bound freight train, consisted of 68 cars and a caboose, hauled by engine 1707, and was in charge of Conductor Sweeney and Engineman Hanson. This train departed from DeBeque, the last open office, 16 miles east of Cameo, at 11:45 p.m., August 30, according to the train sheet, following Train No. 5, and after passing through Cameo it was derailed on encountering a rock slide while traveling at a speed estimated to have been between 20 and 25 miles per hour.

The engine stopped on its left side down the embankment with the front end of the boiler submerged in the river, while the tender broke away from the engine and stopped in an upright position at right angles to the track. The first four cars were derailed and overturned, the thirty-eighth and thirty-ninth cars were slightly damaged, and the forty-second car was derailed but not damaged. The employee killed was the fireman and the employee injured was the head brakeman.

Summary of evidence

Engineman Hanson stated that the last automatic signal was displaying a proceed indication and that the first knowledge he had of anything wrong was when the fireman called to him to stop and he immediately applied the air brakes in emergency; he stood up and could just see the top of the slide against the bank at which time it was only 2 or 3 car lengths distant, and he did not see any dust rising from the slide. He thought that he was possibly 6 or 8 car lengths from the slide when the fireman first warned him and estimated the speed of the train to have been about 25 miles per hour. The headlight was burning and the brakes functioned properly. Head Brakeman Mitchell was looking back when the fireman called to the engineman to stop and on turning around he could see the slide about 2 or 3 car lengths ahead. The slide appeared to slope down to the river but he did not see any dust rising from it. The statements of the members

of the train crew in the caboose added nothing of importance.

Section Foreman Bonello stated that he made a careful inspection of this cut after a small slide occurred on June 19 and at that time he went over the top of the cut and rolled off a small rock, but did not find any dangerous condition, nor did he notice anything unusual when he passed over the track on the morning of August 29. Subsequent to the accident he made another inspection but did not find any dangerous condition and he stated that very little trouble had been experienced in this cut.

Division Engineer Darby stated that the slide consisted of approximately 1,000 yards of mixed material, adobe and rock, and extended a distance of about 100 feet along the track, being about 12 or 15 feet in depth on the north rail and he thought that it started at the brow of the hill approximately 75 feet above the track. Before the occurrence of the slide the center of the track measured 15 feet from the bank, which extended perpendicularly for 10 or 12 feet and then sloped back at the rate of about 1/2 to 1; subsequent to the accident he thought the slope was about 3/4 to 1. He was unable to account for the occurrence of the slide, saying that the formation at that point had been extremely hard at all times and there had been no unusual weather conditions that might have caused a slide. The erosion that takes place was slight and would require a year to fill the ditches, except that a little more would come down during rainy weather, and this cut was not cleaned out as often as many others on the division. He did not believe that there was any difference in the disintegration of the formation in dry or wet weather, although when the adobe is wet it becomes sticky and washes quite readily. Division Engineer Darby stated that there are rocks at the present time that appear as if they might come down and he expected to trim them off; this condition prevails over the entire division. He had been over the track several days before the occurrence of the accident and noticed nothing unusual at that time.

Roadmaster Moriarty stated that on his arrival at the scene of the accident about 4 a.m. he observed that the slide extended down over the track and into the river, and there was a large rock in the river upon which one of the cars was lying; loose gravel continued to fall amounting to about a shovelful or more in an hour. The cut was cleaned out thoroughly during the night following the accident and in a period of 2 days subsequent to that time about 6 yards had fallen. Roadmaster Moriarty stated that he had ridden over this track on the morning of the accident and noticed that the ditches were clean. He further stated that in the past it had been necessary to keep a watchman stationed in that vicinity on account of seepage from an irrigation tunnel that ran through the mountain about 75 feet from and 7

feet above the level of the track; this seepage occurred about 200 feet west of the point of accident and would result in the adobe becoming soaked and oozing out, continually filling the ditches, while the water would make little holes in the adobe. During the winter of 1925-26, however, the Reclamation Service sealed the leak and a few months later it dried out thoroughly, the watchman was discontinued and there has been no seepage during the past 10 years. In 1927 the track was moved outward about 3 or 4 feet from the mountain in order to put in a drainage pipe, make a ditch, and to maintain a roadbed of 14 feet. In June, 1935, there was a small slide at a point about 100 feet east of the point of accident and at that time about 90 yards of adobe came down, covering the track to a depth of from 1 to 1½ feet, and he had the section foreman inspect the top of the bluff. Roadmaster Moriarty further stated that the speed restriction of 25 miles per hour was necessary on account of the 7° 30' curve, with a 5-inch elevation, just west of the point of accident.

The perpendicular wall in this cut measures 15 feet from the center of the track and the slide started on this perpendicular wall at a point 16 feet above the track and extended up the slope for a distance of 82 feet; the highest point of the slide in the center was approximately 89 feet above the tops of the ties. The slide was 100 feet in width and it was estimated that 1000 yards of rock and adobe came down over the track and into the river; the material was very dry and dusty and there was no indication of moisture. A broken rail was found near the western end of the slide, this rail being on the south or river side of the track and being broken about 4 feet from its western end, having the appearance of having been struck by a heavy rock. The break was clean but it was not determined whether the broken parts made sufficient contact to maintain the track circuit and clear the last automatic signal. The rail was buried under several feet of sand and rock and from its location at the western end of the slide, no part of the wrecked equipment could have caused the break.

The last train to pass this point prior to the occurrence of the accident was Train No. 5, a west-bound passenger train, which departed from DeBeque at 11:58 p.m., 7 minutes before the departure of extra 1707.

Discussion

The slide involved in this accident consisted of approximately 1,000 yards of adobe and rock which became dislodged from the bluff on the north side of the track, starting at a point 16 feet above the track and extending upward to a point 89 feet above the track at its highest point; it was 100 feet in width at its base. The

slide took place within a comparatively short period of time before the accident, as the last train to pass over this point was a west-bound passenger train which departed from DeBeque, 16 miles east of Cameo only 7 minutes prior to the departure of Extra 1707 from that point. A rail which apparently had been broken by a falling rock was found buried under the western end of the slide, but the engineman and head brakeman of Extra 1707 said the last automatic signal was displaying a clear indication, indicating either that the track circuit controlling the signal had not been interrupted or else that the slide did not occur until after the engine passed the signal.

Within the last 9 months there have been three serious accidents on this division investigated by this Bureau, including the one here under investigation, due to rock slides, causing the death of 4 and the injury of 2 persons. The first occurred on December 12, 1934, at Niger, Colo., 19.6 miles east of Cameo, and the second occurred on August 4, 1935, at Ruby, 40.5 miles west of Cameo. A slide of smaller proportions also occurred in the immediate vicinity of the one here under investigation in June of this year, covering the track to a depth of from 1 to 1½ feet. The prevalence of these slides, and the ever-present danger of future difficulty from rocks which look as if they might fall at any moment, warrant consideration being given by the carrier to the question of what steps can be taken to avoid the occurrence of accidents of this kind in future.

Conclusion

This accident was caused by a rock slide.

Recommendations

It is recommended that consideration be given by this railroad to the need for more frequent patrol of the tracks, the installation of slide-detector fences or other means of protecting trains against the danger of slides in this territory.

Respectfully submitted,

W. J. PATTERSON,

Director.