

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
DENVER & SALT LAKE RAILWAY

ROLLINSVILLE, COLO.

NOVEMBER 5, 1935

INVESTIGATION NO. 2017

SUMMARY

Railroad: Denver & Salt Lake

Date: November 5, 1935

Location: Rollinsville, Colo.

Kind of accident: Derailment

Train involved: Freight

Train number: Extra 215

Engine number: Engine 215

Consist: Auxiliary water car, 41 loads, caboose

Speed: Undetermined; probably in excess of
60 m.p.h.

Track: Descending grade, 2 percent; track
tangent where runaway started at
East Portal (Moffat Tunnel); 7° curve
to left where derailment occurred at
Rollinsville, 7.63 miles beyond

Weather: Cold; strong wind blowing snow

Casualties: 1 injured

Cause: Runaway; rear portion of train not
properly secured on descending grade
before engine was cut off.

January 27, 1936.

To the Commission:

On November 5, 1935, a runaway freight train on the Denver & Salt Lake Railway was derailed at Rollinsville, Colo., this accident resulting in the injury of 1 employee.

Location and method of operation

This accident occurred on Subdivision 1, extending between Phippsburg and Denver, Colo., a distance of 167.99 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 runaway started at East Portal, Moffat Tunnel, and the derailment occurred at Rollinsville, 7.63 miles east thereof; proceeding eastward from East Portal, the track is composed of a series of sharp curves and short tangents, followed by a 7° curve to the left 675 feet in length, the first mark of derailment appearing on this curve at a point approximately 173 feet from its western end. After leaving East Portal the grade for east-bound trains is descending for several miles, with a maximum of 2 percent; on the curve at Rollinsville the grade is 1.01 percent. The passing siding at East Portal is 3,548 feet in length and parallels the main track on the north, the west switch being located 100 feet east of the tunnel.

The track is laid with 100-pound rails, 39 feet in length, with an average of 22 ties to the rail length, double-spiked, fully tieplated, and ballasted with volcanic cinders to a depth of 8 inches; four rail anchors per rail are used. The super-elevation of the outside rail on the 7° curve involved is 5 inches. The maximum authorized speed for freight trains in this vicinity is 25 miles per hour. On east-bound tonnage trains retainers are used in light or 15-pound position.

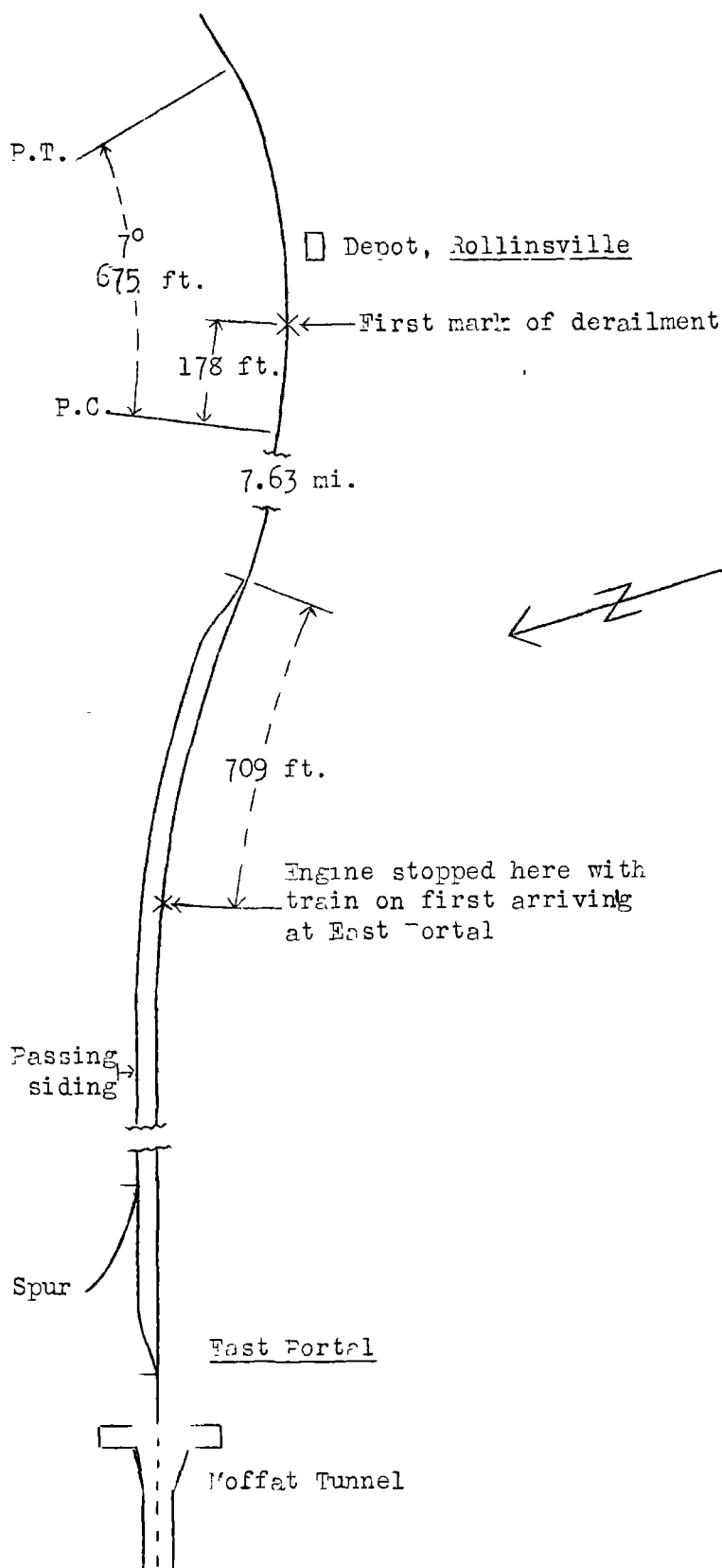
It was cold and a strong wind was blowing snow around at the time of the accident, which occurred about 11:03 a.m.

Description

Extra 215, an east-bound freight train, consisted at the time of the accident of an auxiliary water car, 2 cars of sand and gravel, 39 cars of coal, and a caboose; this train was being hauled by engine 215 and was in charge of Conductor Fall and Engineman Ohrns. It stopped at the apex of two grades, approximately in the center of Moffat Tunnel, to permit helper engine 300 to be cut off from the rear of the train. Extra 215 then proceeded and arrived at East Portal at 10:44 a.m., according to the train sheet, where it stopped on a 2 percent descending grade with the engine at a point about 700 feet west of the east

Inv. No. 2017
 Denver & Salt Lake Ry.,
 Rollinsville, Colorado
 Nov. 5, 1935

| | |
|--------------------------------|------------|
| • Denver, | |
| | 42.01 mi. |
| ✕ Rollinsville (Derailment) | 4.96 mi. |
| • Tolland | 2.67 mi. |
| ✕ East Portal (Runaway) | 3.20 mi. |
| • Apex | 4.02 mi. |
| • West Portal | 9.12 mi. |
| • Tabernash | |
| | 102.01 mi. |
| • Phippsburg | |



switch of the passing siding. Extra 215 stood at this point approximately 8 minutes, and after Train No. 1, a west-bound passenger train, had taken siding, engine 215, the water car, and two cars of sand and gravel were cut off and moved eastward far enough to clear the east switch, preparatory to backing in and setting out the 2 cars of sand and gravel on a spur leading off from the siding. Before cutting off no hand brakes had been set on the rear portion of the train and it started moving down the grade almost immediately after the forward portion stopped beyond the switch. Realizing what was happening, Engineman Ohrns decided to make a run for Tolland, 2.67 miles east of East Portal, with the purpose of opening the passing track switch at that point to derail the runaway cars and thereby saving the engine. The runaway cars, however, overtook and coupled to the cars behind the engine near milepost 48.41, located about 1.08 miles from East Portal, and the engineman then shut off steam and applied the brakes in emergency on the engine and 3 cars, following which both he and the fireman jumped from the engine; the runaway train continued about 6.55 miles farther down the grade to Rollinsville before being derailed.

Engine 215 stopped on its right side south of the main track, with its front end 275 feet east of the depot at Rollinsville; the tender and first 38 cars also were derailed, 32 of these being totally destroyed, while the 4 rear cars and the caboose remained on the rails. The employee injured was the engineman.

Summary of evidence

Engineman Ohrns stated that the air brakes were tested by car inspectors and that the train departed from Phippsburg at 11:45 p.m., November 4, making various stops en route to perform work, meet opposing trains, cut off and take on helper engines, turn up retainers, etc. It arrived at Tabernash, 102.01 miles east of Phippsburg, at 8:35 a.m., November 5, without undue incident, at which point road engine 200 was exchanged for engine 215 and then engine 200 was coupled to the rear of the train as a helper engine. After leaving Tabernash the train stopped at West Portal and again in the tunnel at the apex of the two grades. The air brakes functioned properly; the engineman said that the brake-pipe pressure registered 80 pounds and after starting down the hill he made two brake-pipe reductions before reaching the signal located about 1,750 feet inside the east end of the tunnel, where it is required that speed must not exceed 5 miles per hour; after leaving the tunnel he made three reductions, totaling 20 pounds, until the train stopped. No difficulty was encountered and the train was stopped on the 2 percent grade in the usual manner, with the slack bunched, and the engineman then lapped the brake valve. Engineman Ohrns

looked back and saw Flagman Karney coming over the tops of the cars from the caboose, apparently turning up retainers, and the engineman said he figured on keeping the brakes applied for 2 or 3 minutes while the flagman was doing so. The head brakeman walked forward to the east switch to head in the passenger train. Shortly afterwards the conductor, who had been riding on the engine and who had dropped off about the time the train stopped, came back to the engine on the left side and told the engineman that he had been trying to transmit a signal, that he wanted to get the pin so as to make a cut and set out the cars. The engineman, who did not know the conductor had cut the air back of the three cars, told the conductor that Train No. 1 had not arrived and that it would be necessary to perform switching on the spur, so that it would be best to leave the air applied on the train as long as possible. The conductor then said that he had cut off on the left side and that he would go back and cut the air in again; the train had been standing about 3 minutes with the brake valve in lap position when this conversation took place and the engineman said he knew the conductor cut the air back in as he was watching the brake-pipe indicator, which started to go down slowly. After the engineman saw the indicator begin to move, he started recharging the train line, and he said it took almost 2 minutes to recharge the train line to a pressure of 80 pounds, having depended upon the engine brakes and retainers to hold the train for a period of about 6 minutes after it stopped and while the train line was being recharged. The conductor again came to the engine, said he was going back to make the cut, and the engineman then made a 20-pound reduction and obtained a long brake-pipe exhaust, whereas in the event the air had been cut through on only the first three cars, all he would have obtained would have been a short blow at the brake-valve exhaust. The conductor then signaled the engineman that he wanted to pull the pin, the engineman immediately started to back up and then the cut was made, after which the engine and three cars moved ahead and stopped east of the switch, accompanied by the conductor. After stopping east of the switch the rear portion of the train started to move down the grade and the engineman at once sounded several short blasts on the whistle and pointed to the cars. At first the engineman thought of backing up and smashing the train, but both the conductor and head brakeman started for the train and he thought that one of them would be able to open an angle cock and consequently he moved the engine ahead a few car lengths to allow them more room and also to prevent the moving cars from running into the front portion of the train. When he definitely realized that no attempt was being made to open the angle cock he decided to make a run for Tolland and open the west switch of the passing track. He opened the engine wide and it attained a speed of 50 or 55 miles per hour; however, on nearing bridge 48.41, located about 1.08 miles from East Portal, he glanced back and saw the runaway cars about 2 or 3 car lengths behind, and then shut off steam and applied the brakes. When the runaway cars caught up with and coupled to the front portion of the

train the engine slacked the speed to a certain extent, but after passing over the bridge the speed of the runaway train was 55 or 60 miles per hour, and he realized there was nothing more he could do and both he and the fireman jumped from the engine. Engineman Onrns further stated that under ordinary conditions it would not have taken 10 minutes to perform the work contemplated at East Portal, and that in such case it is not the practice to set the hand brakes, as required by the rules, before an engine is detached. He was at a loss to know what caused the cars to start moving, maintaining that the train stood on the descending grade for about 6 minutes with only the engine brake holding it, that he fully recharged the train line before the front portion was cut off, that he made a 20-pound reduction just before the conductor made the cut, that most of the retainers had been turned up when this reduction was made, and that he knew from the action of the brake-pipe indicator and the full brake-pipe exhaust that the air was cut through the entire train.

Fireman Miller stated that after the stop was made at East Portal he went back to measure the water supply, following which he returned to the engine, and then the conductor came to the left side of the engine and said he wanted to make the cut behind the third car. Fireman Miller's version of what transpired from this time until he and the engineman jumped off agreed in substance with that of the engineman. The stop at East Portal was made as usual and he could not understand why the cars started moving, as he was certain that the brakes were applied throughout the entire train before the final cut was made, the brake-valve exhaust being heavy and long, and he said that the engine had not been detached for more than 2 minutes before the rear portion of the train started moving. Fireman Miller said he suggested that the engineman back the engine against the rear portion of the train at the time it was discovered the cars were moving, but the engineman afterwards told him he thought one of the trainmen would endeavor to open an angle cock.

Conductor Hall stated that on arrival at East Portal he dropped off for the purpose of making the cut behind the third car, and closed the angle cocks and uncoupled the hose. He was unable to make the cut, however, as the slack was stretched, and finally went forward to the engine, told the engineman what he wanted to do, and found that the engineman wanted to recharge the train line before the cut was made. The conductor then said that he would go back and recouple the air hose and open the angle cocks; after doing so he returned to the engine and waited until the rear end of Train No. 1 passed by on the siding. The engineman then said it was all right to cut off, and the conductor went back and made the cut, and said that in addition he opened the angle cock slightly on the head car and released some air. The engineman slacked back and the conductor pulled the pin and rode the cars down over the switch, where he got off and was about to open the switch when he heard some one shout and also heard one

blast sounded on the whistle, following which he saw the cars moving down the grade. The conductor said he tried to signal the engineman to set the air and get off the engine, and about the same time started running toward the moving cars in an endeavor to open the angle cock at the head end, but when the cars reached him they had gained considerable momentum, moving about 20 miles per hour, and he could not get on them. The pistons were out on some of the runaway cars when they passed him, but he did not observe any brake shoes grinding against the wheels. The conductor did not know whether the engineman applied the brakes before the train line was cut the second time saying that although he was standing beside the engine, there was a strong wind blowing against it and making quite a noise and that he did not hear any application being made after the train line had been recharged. Conductor Hall further stated that no hand brakes had been set, as the 10-minute period authorized by verbal instructions within which to hold the train on the grade by means of the air brakes, had not been exceeded. He estimated that 5 or 6 minutes had elapsed from the time the stop was made until the final cut was made, and that the flagman had time to set up some retainers on the rear cars but that no retainers were turned up on the cars at the head end. Conductor Hall also said that the air brakes should have held the cars at this point if they had been properly applied. He had not seen any outsiders around the train or riding upon it.

Head Brakeman Frawley stated that when his train stopped at East Portal he immediately went forward to handle the east switch for the passenger train. After that train was in the clear he closed the switch, following which his own engine and three cars moved eastward over the switch, and he then saw the moving cars and shouted a warning. He started running toward the runaway cars, ahead of the conductor, in an attempt to open the angle cock at the head end of the lead car, but said that on reaching a point about 4 or 5 car lengths west of the switch the cars passed him at a speed of about 30 miles per hour and he was unable to get on; he saw retainers turned up on some of the cars, the pistons were out on others, and some brakes near the rear end seemed to be applied but he could not say whether the brake shoes were grinding against the wheels as the cars passed him.

Flagman Karney stated that shortly after the stop was made at East Portal he started to turn up retainers, working forward from the caboose; the first retainer he turned up, which was on the rear car, was blowing in release as he raised the valve handle and then it stopped when the retainer was up, but he could not say as to the others as the wind was blowing hard, causing considerable noise. He proceeded over the tops of the cars turning up retainers until he reached a point about 12 cars from the head end, and was unaware that the engine had been cut off; on looking toward the ground, however, as he reached down for a retainer, he noticed that the cars were moving and then looked ahead and saw

that the engine and first three cars had been cut off. Flagman Karney set one hand brake and got off, about 750 feet west of the east switch, at which time the speed was about 6 or 7 miles per hour, and he said that he then went in between the cars and tried to break an air-hose connection, but the air hose was frozen and the cars were gaining momentum, consequently he got out and let them go; he did not attempt to board the caboose as it passed him as it was going too fast. Flagman Karney did not see or hear any brake shoes grinding against the wheels and he was satisfied that the air brakes were not set on the cars as they passed him.

General Superintendent Johnson and Master Mechanic Peterson said the employees had been verbally instructed to disregard the requirements of the rule in regard to setting a sufficient number of hand brakes to insure full protection before an engine is detached from a train, to the extent that with the air brakes applied and working properly, and a sufficient number of retainers turned up at the time the release is made, the air brakes might be depended upon to hold the train on descending grades for a period not to exceed 10 minutes. After the accident the master mechanic examined the wreckage and on the engine he found that several driving-wheel tires were broken and the brake shoes melted. He found about eight retainers in holding position, but the other cars were badly damaged and he could not get near enough to examine the retainers on them. Examination of the brake shoes and wheels of some of the cars in position to be seen, showed that the brakes had been applied on only two of the cars, these being the cars of sand and gravel.

Engine 215 was aallet compound locomotive of the 2-6-6-2 type, equipped with standard H6-ET air-brake equipment, with two Westinghouse 8 $\frac{1}{2}$ -inch cross-compound air compressors and two main reservoirs. Subsequent to the accident it was found that all driving-brake shoes had melted, all of the tires had slipped, and five of them had been broken. Approximately thirty pairs of wheels were examined, but only two showed blue wheels and burned brake shoes, and these apparently were from the two cars of sand and gravel attached to the engine. The wheels of the caboose and four cars that were not derailed, as well as those of some of the cars immediately ahead of them, failed to show any sign of having been heated.

Discussion

Operating rule 102-B of this company provides in part as follows:

"Before an engine is detached from train, sufficient hand brakes must be set to insure protection."

However, General Superintendent Johnson stated that he had given

the men to understand that if the air brakes are in satisfactory operating condition the air brakes can be depended upon to hold the train for a period not in excess of ten minutes.

The evidence clearly shows that the air brakes on this train were in proper condition and operated satisfactorily up to and including the final stop at East Portal, where the stop on the 2 percent descending grade was made without difficulty and in the usual manner. The train stood at this point for several minutes before the engine was detached, during which time the brakes were released, recharged and then reapplied just before the cut was made for the purpose of setting out cars. According to the statements of the employees involved, when the train stopped the conductor dropped off the engine and went back to cut the train behind the third car, closing the angle cocks and disconnecting the hose for that purpose; he then returned to the engine, was told by the engineman that the latter did not want to cut off until an opposing passenger train had arrived and taken siding, and consequently he returned to the rear of the third car, recoupled the hose and opened the angle cocks. The engineman was watching the brake-pipe indicator and saw the pressure start to go down; he then released the brakes, recharged the train line, and after the passenger train entered the siding notified the conductor he was ready to cut off, and made a 20-pound reduction; the long exhaust from this reduction indicated that the train line was intact, and the conductor went back a third time and made the cut. The flagman had turned up retainers on a considerable number of the cars by the time the 20-pound reduction was made. However, the engine and three cars had been detached only about two minutes and had moved ahead a distance of only 1,000 feet, or less, when the cars started to move. Observations by members of the train crew indicated that on the rear portion of the train some of the pistons were out but no one noticed brake shoes grinding against the wheels. Once the cars started to move they ran freely; Flagman Karney set one hand brake, then got off and when the rear end passed him it was going too fast for him to board the caboose; Conductor Hall and Brakeman Frawley ran toward the cars but before the cars reached the east switch the speed was so high that they could not get on the cars; examination of the wheels of the equipment not derailed and of many wheels in the wreckage failed to reveal evidence of overheating, and it therefore is apparent that the air brakes were not applied on the cars left standing on the grade.

It could not be determined positively why the air brakes were not applied; the conductor and engineman, who were men of long experience in mountain grade operation, were at a loss for any explanation. However, during the operations which immediately preceded the runaway, the conductor and engineman were in direct contact with each other, and had ample opportunity for a clear and definite understanding with each other as to what was to be done and how it should be done; it was incumbent on them to know

beyond any question or doubt that the train was properly secured before the engine was cut off.

As previously noted, the officials of this railway have authorized employees to disregard the rule requiring hand brakes to be set on cars left standing and to depend on the air brakes if the engine is not to be away from its train more than 10 minutes. Experience has demonstrated the necessity for the additional protection to be afforded by the use of hand brakes under these conditions. The necessity for a rule of this kind is particularly apparent on the Denver & Salt Lake Railway, which traverses rugged and mountainous territory, imposing the duty upon officials and employees alike of taking every precaution to guard against the occurrence of an accident of the type here under investigation. Because of their action in permitting and authorizing practices not in conformity with the rules, operating officers must share in the responsibility for this accident.

Conclusion

This accident was caused by a train running away on a heavy mountain grade, due to the fact that the portion of the train left standing on the grade was not properly secured before the engine was cut off.

Recommendation

It is recommended that steps be promptly taken to enforce the provisions of the rule requiring that a sufficient number of hand brakes be applied to insure protection before an engine is detached from its train.

Respectfully submitted,

W. J. PATTERSON,

Director.