

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE
DENVER & RIO GRANDE RAILWAY, NEAR SCENIC, UTAH,
ON OCTOBER 18, 1917.

December 14, 1917.

On October 18, 1917, there was a derailment of a runaway freight train on the Salt Lake Division of the Denver and Rio Grande Railway, near Scenic, Utah, resulting in the death of one person and the injury of two persons. After investigation of this accident, the Chief of the Bureau of Safety reports as follows:

The Salt Lake Division of the Denver and Rio Grande railroad extends between Helper and Ogden, Utah, a distance of 156.5 miles. That portion of the road upon which this accident occurred is a double-track line, upon which trains are operated by the time-interval and dispatching system; no block signals are used. At Soldier Summit, a station 25 miles west of Helper, the track reaches the high point in its passage over a chain of mountains, and from this point the track continuously descends to Thistle, a station 29.4 miles farther west, on a grade which reaches a maximum of two per cent. At Soldier Summit is stationed a force of car inspectors and repairmen, whose duty it is to inspect all trains arriving there, and adjust brake equipment so that trains may proceed with safety in their descent of the hill on either side of the summit.

The train involved in this accident was westbound extra 1184, in charge of Conductor Perkins and Engineman Strohsahl. This train left Helper at 3 p.m., with 32 loaded cars and a caboose, hauled by engine No. 1184, assisted by a pusher engine. The train arrived at Soldier Summit at 7.10 p.m., and there the pusher engine was detached and 33 additional loaded cars were added to the train for descent of the hill on the western side of the summit. After making up the train and subjecting the air brakes to the usual inspection and test, the train left Soldier Summit about 9.10 p.m., with 65 loaded cars, weighing 4,007 tons, and a caboose. Shortly after leaving the summit Engineman Strohsahl lost control of the brakes, and the speed of the train became so high that upon reaching a 9-degree curve about 7 miles west of the summit, about 9.25 p.m., 57 cars were derailed. The speed of the train at the time of derailment is estimated to have been between 40 and 50 miles per hour. Eight cars at the rear of the train remained on the track. The caboose was not involved in the wreck, as it was detached from the runaway train and brought under control -

before reaching the place of derailment. The engine was not derailed; it broke away from the train, passed safely around the curve where the wreck occurred, and ran unattended (both engineman and fireman having jumped off previous to the derailment) for a distance of nearly 5,000 feet before coming to a stop, with the tender brake applied and the reverse lever in back motion.

The derailment occurred on a 3 per cent grade about 1,500 feet west of mile post 658, at a point about 375 feet west of the east end of a 9-degree curve, 2,777 feet long, known as "horns-shoe curve." Approaching the point of derailment from mile post 657, there is a 6-degree curve to the left about 400 feet long, followed by a tangent, 3,220 feet long, leading to an 8-degree curve to the left 950 feet long, following which is a tangent 1,693 feet long leading to the 9-degree curve to the right on which the derailment occurred.

The track at this point is laid in a cut 50 feet deep with 90 pound rails, 33 feet long, and 20 oak ties to the rail. The curve has 3 inches elevation, and the rails are double spiked on alternate ties. All ties on this curve have tie-plates, and each rail has 4 anti-rail creepers. The track is well ballasted and is maintained in good condition.

From the point of derailment westward 860 feet of the westbound track was torn up; 560 feet of the eastbound track was also demolished, and the derailed cars were piled up in a tangled mass of wreckage over both tracks between the walls of the cut. At the time of the accident eastbound passenger train No. 2 was ascending the grade a short distance west of the point of derailment, and it collided with the wreckage piled up in the cut. The speed of the train was comparatively low, however, and the collision caused only slight damage to the leading engine of the train. At the time of the accident the weather was clear and cool.

Engineman Strohsahl's statement is that upon arrival of his train at Soldier Summit he made a heavy brake pipe reduction, upon signal by the car inspector, so as to test piston travel and see if all brakes applied. He held the brakes applied until he received a signal from an inspector at the rear end of the train, and then released. After making this test his engine was cut off and a number of cars were picked up and added to the train. After making up the train he was notified by a car inspector that the air was coupled up, and he then pumped up brake pipe pressure to 80 pounds, the pressure he usually carries down the hill. He then made a brake

pipe reduction of 25 pounds, and held the brakes applied for two minutes, until he got a signal to release from the rear end of the train. He had no difficulty in pumping up the required pressure. When the first brake test was being made he noted a brake pipe leakage of about ten pounds on the 32 cars while he had his brake valve on lap; on the second test, after the train was made up, he had his valve on lap for two minutes and noted a leakage of 2 or 3 pounds per minute. So far as brake pipe leakage was concerned he considered the train all right. Upon leaving Soldier Summit, as soon as he saw the rear end of the train break over the top of the hill he made a heavy brake pipe reduction, which did not take hold very well, and he made a further reduction of 10 pounds, making a total reduction of about thirty pounds on the first application. This application checked the speed, but he noted considerable leakage, and when the pressure had leaked down to 25 pounds he placed the valve in full release position and held it there until recharge was made, when he immediately made another application with brake-pipe reduction of 20 pounds and placed his valve on lap and called for brakes, as the retainers did not seem to hold the brakes applied when he made the release and he felt that he had lost control of the train. He was then about two miles out of the summit, and he told the head brakeman to get out and set hand brakes. He made no further reduction, but held his valve on lap until going through Scenic (5 miles west of the summit), at which time the train was running about 18 miles per hour, and upon noting the gauge he saw that his air was all gone. He then placed the valve in full release position and reversed the engine, having previously cut out the driver brake. He then made an emergency application, and as there was no reduction in speed he and the fireman left the engine, at a point about one mile east of the point of derailment, the speed of the train at the time being between 35 and 40 miles per hour. After leaving the engine he moved back, as soon as he was able, to find the fireman, who preceded him in jumping off. He found the fireman about 15 or 20 cars back, and about a minute later he saw the lights of the caboose coming down the hill; this was 3 or 4 minutes after the train passed him subsequent to his leaving the engine. He called, and the caboose was stopped by the conductor and rear brakeman, and he and the fireman were assisted into the caboose, which then continued its descent of the hill until it reached a point opposite the engine which was standing on a lower level, having come to rest after breaking away from the train. He

and the conductor then made their way down to the engine and ran it back to where train No. 2 was standing. He was then exhausted on account of his injuries, and they helped him off the engine and put him in a coach on the passenger train. He said that when he made the first brake-pipe reduction after leaving the summit, the train was running about 12 miles per hour, and he kept the brakes applied 4 or 5 minutes before releasing. He made 2 reductions on this application, drawing off 35 pounds pressure, and reducing the speed to 8 or 10 miles per hour before releasing. He thought he could have stopped the train with the first brake application by going to emergency. On the second application he reduced brake pipe pressure to 30 pounds and it leaked down to 5 pounds before the emergency brake application was made.

The statement of Conductor Perkins was that his train arrived at Soldier Summit at 7.10, and departed about 9.10 p.m. He had 32 loads into the summit and picked up 33 additional loads there, making his train consist of 65 loaded cars and caboose on leaving the summit. He instructed the head brakeman about manipulating the retainers and personally noted their position on all but two or three cars; with the exception of these few cars, which he did not observe, he was satisfied that all retainers were turned up and in proper position before the train left the summit. Upon entering the caboose as the train was pulling out he noted that the air gauge registered 80 pounds brake pipe pressure. The first brake application was made when the rear end of train was about 25 or 30 car lengths over the brow of the hill, at which time it was running 20 or 25 miles per hour. He said it was nothing unusual for trains to attain that rate of speed before brakes were applied upon leaving the summit. The first brake application reduced the brake-pipe pressure to 60 pounds and reduced the speed to about 8 miles per hour, which speed was maintained while the brakes remained set. When brakes were released speed picked up very quickly, and brake pipe pressure built up only to 70 pounds when another reduction was made, bringing pressure down to 55 pounds. This brought speed down to 10 or 12 miles per hour; a further reduction was made, bringing brake pipe pressure down to 40 pounds, when he and Brakeman Wilson started out to set brakes. The train was then running between 15 and 18 miles per hour. He and the brakeman doubled on the first two brakes next the caboose, and then singled out. They set brakes until he got to the fourteenth or fifteenth car from the caboose, at which time the speed had increased to 30 miles per hour. He lost his brake club at this point, and becoming convinced that his efforts were

useless he started back to the caboose, losing his lantern while going over a box car, and being compelled to crawl on his hands and knees over four or five cars before reaching the caboose, as it was impossible to maintain footing on the swaying cars, due to their high speed. He met the brakeman on his way back, and they made their way to the caboose together. Arriving there they looked at the gauge and found pressure entirely gone, after which they cut the caboose off and brought it under control. The caboose was cut off after it passed the east switch at Scenic, with the train running 45 miles per hour. After bringing the caboose under control they continued on down the hill until they met the engineman and fireman. After picking them up they went on until they saw the engine standing on a lower level where the track turned back on itself. He then assisted Engineman Strohsahl across and helped him on the engine, after which they backed up towards the wreck to see what damage had been done to train No. 2. He said that when the train left the summit he was satisfied that it had received proper inspection, and as the train pulled past him he observed it and did not notice any excessive brake pipe leakage. He did not ask the car men at the summit about the condition of the train before leaving there. He stated his belief that it is dangerous to go down this hill with a train of 65 cars, and that the limit should be fixed at 45 or 50 cars; he said: "Everybody is afraid of 65 cars down that Soldier Summit hill."

Fireman Eekstrom stated that the first brake application was made when they were about a mile out of the summit. This slowed the train down to about ten miles per hour. After releasing the brakes the train ran about half a mile before the second brake application was made, and the engineman then whistled for brakes and told him to tell the head brakeman to get out and help hold them. He said he looked back and saw two lights on top of the cars at the rear end of the train, and that when the train had run about a mile after the second brake application was made the engineman released and recharged and put the brake valve in emergency position. The engine was coming into Scenic, and the emergency application did not seem to do any good. When the second application was made the train was running 15 or 20 miles per hour, and this application did not reduce the speed any. When going through Scenic they lost all hope of being able to control the speed, and about a mile west of Scenic he and the engineman jumped off. The train at that time was running about 35 miles per hour, and the speed was steadily increasing. After the engineman and conductor recovered the engine and backed it up to

the wreck they got him and took him into the coaches. He is positive that Engineman Strohsahl released the brakes the second time and endeavored to recharge before making the emergency application. There were two reductions on the second application. He thought the train could have been stopped with the first brake application.

Brakeman Wilson stated that he assisted in picking up the loads at the summit, and after the train was made up he started 48 cars from the rear end and turned up the retainers on all the cars back to the caboose. He did not see the retainers on the head end of the train, but felt confident that the head brakeman had them in proper position. He and the conductor got on the caboose as the train pulled out. He noted that caboose air gauge showed 80 pounds brake pipe pressure. The first brake application was made when caboose was about half a mile out of the summit. The train was then running about 18 or 20 miles per hour, and the brake application brought speed down to 8 or 10 miles per hour. Train ran about a mile before release and second application were made. On second application air pressure was reduced to 40 pounds and he and the conductor went out to set hand brakes. He heard no call for brakes; hand brakes were applied on account of low air pressure, and not because of fear that the train was then beyond control. Train was running about 18 miles per hour when he and the conductor started out to set brakes, and speed had increased to 30 or 35 miles per hour when they started back to the caboose. Speed was about 45 miles per hour when they cut the caboose off. After picking up the engineman and fireman, and dropping the caboose down to where the rear end of the derailed train was standing, he took his flagging equipment and went back to flag.

Car inspector Lee stated that he assisted in the inspection of extra 1164 when it arrived at Soldier Summit at 7.10 p.m., made minor repairs and necessary adjustments, the trainmen then went over it and turned the retainers up and it left there at 9.10 p.m. He was positive that all the retainers were turned up before the train left there and said that the air brakes were in good condition but that two retainers on the head end and seven on the rear end of the train leaked off. He said that he saw the trainmen go over the train and bleed off the retainers and turn them up again. He stated that when making brake tests three inspectors went over the train to see if the retainers were holding and he considered extra 1164 in a safe condition to leave Soldier Summit and go down the hill. He said it was the practice if a car has inoperative air brakes either to put

the brakes in operating condition or set out the car before the train is permitted to leave. Inspector Lee said they had no established practice at Soldier Summit of notifying enginemen or conductors concerning the condition of air brakes but sometimes told them about cars having poor braking power.

Car Inspector Jorgeson stated that he assisted in the inspection of extra 1184 at Soldier Summit on the night of the accident, found all the air brakes working properly, and made only a few light repairs, adjusted piston travel, etc. All the brakes remained applied until he reached the rear of the train and he considered the condition of brake equipment on this train as above the average and as safe a train as any they had permitted to leave Soldier Summit having the Harriman detachable equipment. He stated that the air brakes on the Harriman cars, menning cars from the Union Pacific, Oregon-Washington Railroad & Navigation Co. and Oregon Short Line, do not hold as well as brakes on their own cars and considers it unsafe to handle a train made up solely of those cars down the grade from Soldier Summit, and thought there should not be more than 25 or 30 Harriman cars in a train of 65 cars on this grade. Extra 1184 had 37 Harriman cars on the night of the accident in the rear portion of the train. He said that trains leaving Soldier Summit must have all the air brakes operating and in any event he does not permit a train to go down this grade with more than three cars having inoperative air brakes.

Car Inspector Warren stated that when extra 1184 arrived at Soldier Summit the engineman set the air brakes and he assisted Inspectors Lee and Jorgeson inspect that train. He said he inspected the rear portion of the train and found seven or eight retainers had leaked off, stopped the leaks in three or four of them, and after the inspection and test had been completed he considered the train in as safe condition as the average that go down this grade. He said that several slack adjusters on the Harriman equipment were blocked up on account of ratchet cogs being worn, pieces of boards and old brake shoes being used for that purpose.

Trainmaster Penwarden stated that he arrived at point of derailment at about 11.45 p.m. and examined the wheels to ascertain whether or not the brakes had been set on the rear end of the train and on 8 cars next the caboose the wheels showed no indication of brake-shoe friction. He said that if the hand brakes had been set tightly for any great distance the wheels would remain quite warm for two hours after the accident and from this examination

he believed that the hand brakes had not been set on the rear of the train; the wheels of the five head cars were blue on account of being overheated by brake shoe friction. He stated that the braking power on the Harriman cars was less than on their own cars. He did not think it hazardous to let a train of 85 cars attain a speed of 12 miles an hour down a 2% grade, relying upon three men to control it by means of hand brakes in case of an air brake failure. He stated, however, that in the handling of trains containing Harriman cars, when it was felt that they were not in good condition, verbal instructions had been issued to keep the speed down to seven to ten miles per hour; in general, the question of speed was left to the judgment of engineers. He stated that he asked Conductor Perkins if it was not true that the train got away from him right from the summit, and the conductor replied that he thought it did.

This accident was caused by Engineman Strohsahl's error in judgment in permitting the train to attain too high a rate of speed before making a brake application, and in releasing and attempting to recharge for a second application after reducing brake pipe pressure below point of equalization.

Rule 472 of the rules of the operating department of the D. & R. G. Railroad provides that

"In case of trouble arising, trains must be stopped at once, defects in air brake apparatus remedied, and report made to the superintendent."

It was also brought out in the investigation that one of the instructions given engineers in air brake examinations was that if it required more than a 12-pound reduction to reduce the speed of a train the brakes must not be released, but train must be brought to a stop and the trouble remedied. This instruction was regarded as having all the force of a rule. In the first brake application Engineman Strohsahl reduced his brake pipe pressure 30 pounds in reducing the speed of his train from about 20 miles per hour to 8 or 10 miles per hour, and according to his own statement he could have brought the train to a stop had he continued the application instead of releasing and attempting to recharge. The excessive brake pipe reduction necessary to check the speed of his train should have warned him to take no chances. The evidence indicates that the train was properly inspected at Soldier Summit, and brakes were in average condition upon leaving there. Had the engineman exercised good judgment in handling the brakes there is every reason to believe that the accident would not have occurred.

Engineman Strohsahl entered the service of the D. & R. G. Railroad as locomotive fireman on September 19, 1907, and was promoted to engineman on January 10, 1912. His record is good.

Conductor Perkins was employed as brakeman September 20, 1907, and was promoted to conductor May 6, 1913. His record is good.

At the time of the accident the engine crew had been on duty 6 hours and 40 minutes and the train crew 7 hours and 10 minutes.

W. P. B.

