

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE  
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED  
ON THE ATCHISON, TOPEKA & SANTA FE RAILWAY  
NEAR CAJON, CALIF., ON JULY 15, 1923.

August 31, 1923.

To the Commission.

On July 15, 1923, there was a derailment of a freight train of the Los Angeles and Salt Lake Railroad, Union Pacific System, on the line of the Atchison, Topeka & Santa Fe Railway near Cajon, Calif., resulting in the death of two employees and the injury of one employee. This accident was investigated in conjunction with a representative of the Railroad Commission of California.

Location and method of operation.

This accident occurred on the First District of the Los Angeles Division, extending between Barstow and San Bernardino, Calif., a distance of 81.6 miles, in the vicinity of the point of accident this is a double-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 1,550 feet east of the station at Cajon, approaching this point from the east the track is composed of numerous sharp curves and short tangents, followed by a 6-degree curve to the right 814 feet in length, the accident occurring on this curve at a point 217 feet from its eastern end. The grade between Summit and Cajon, a distance of 6.6 miles, averages almost 3 per cent descending for westbound trains. The track is laid with 90-pound rails, 33 feet in length, with about 22 treated oak ties to the rail-length, and ballasted with gravel. Atchison, Topeka & Santa Fe Railway inspectors are held responsible for the condition of Los Angeles and Salt Lake equipment operated between Barstow and San Bernardino. The weather was clear at the time of the accident, which occurred at about 8.10 p.m.

### Description.

Westbound freight train extra 6085 consisted of 30 loaded cars and a caboose, hauled by engine 6085, and was in charge of Conductor Frazier and Engineman Holland. This train left Summit at 7.41 p.m., with the retainers on all the cars turned up. After having proceeded about a half mile, sparks were seen flying from under the first car ahead of the caboose, due to a break beam chafing the wheel, and the train was brought to a stop on the heavy descending grade by the use of, and held only by, the air brakes; the air brake on this car was released, the retainer turned down, and the brake beam wired up, the duration of this delay being estimated to have been about 14 minutes. Extra 6085 then started down the hill again, got beyond control, and on reaching a point east of Cajon was derailed on the 6-degree curve while traveling at a speed estimated to have been between 60 and 80 miles an hour.

The engine and 26 cars were derailed to the left and piled up in a space of about 416 feet, the engine being entirely stripped of its appurtenances and most of the cars totally demolished; the forward truck of the 27th car was also derailed. The employees killed were the fireman and head brakeman.

### Summary of evidence.

Engineman Holland said that on the arrival of his train at Barstow he made a 20-pound reduction and left the air brakes set while he went to a restaurant. On his return to the engine he found an air-brake clearance card which stated that the air brakes were working on 23 cars and cut out on 2 cars, he then released the air brakes and the brake-pipe pressure was pumped up. Stops were made at various points en route, including one at Leon for the purpose of picking up five cars, and another at Victorville for the purpose of cutting a helper engine into the train near the rear end. After picking up the cars at Leon the air brakes were sticking and he said he applied the brakes on the entire train so as to release the brakes which were stuck, no test of the air brakes was made at either of these points. On the arrival of the train at Summit the helper engine was cut out, and about three or four minutes after the train had been coupled together a signal was given to apply the air brakes, which was soon followed by a signal to release, and then a signal to

proceed. Engineman Holland said the brake-pipe pressure leaving Summit was slightly more than 90 pounds and that after proceeding a short distance he made a brake-pipe reduction for the purpose of charging the retainers. Shortly afterwards the fireman said a stop signal was being given from the rear end, at which time the speed was 3 or 4 miles an hour, and he at once made a full service application, brought the train to a stop, and released the automatic brake, depending on the independent brake to hold the train. The duration of this stop was 13 minutes, in which time the train line was recharged to 90 pounds, he also said that during this time he did not feel any slack running down against the engine. When a proceed signal was given, Engineman Holland released the independent brake, the train started, and when it was traveling at a speed of 3 or 4 miles an hour he made a 20-pound reduction, the brakes seemed to take hold and he then placed the brake valve in full release position. The speed increased immediately and in about a minute, when it had reached 8 or 10 miles an hour and the train line had practically recharged, he made another 20-pound reduction; the exhaust was quite long and he judged the brakes were coupled throughout the train. This application did not seem to have any effect, however, and without releasing he immediately moved the brake valve to the emergency position, at the same time sounding the whistle signal for hand brakes. Engineman Holland then started back over the train, trying the hand brakes on the first two or three cars, found them set, saw the head brakeman setting hand brakes a little farther back in the train, and returned to the engine. The train was then in the vicinity of Dell, 3.8 miles from Cajon, and he placed the brake valve in full release position so as to recharge the train line and make another attempt to stop the train at a point west of Gisa, 1.2 miles from Dell. When this point was reached he again placed the brake valve in the emergency position, but it did not seem to have any effect and he then went back on the first car, where he was located at the time of the derailment. Engineman Holland thought the head brakeman had set the hand brakes on the first five cars in the train, as there were coal cars behind these over which it would have been impossible for the brakeman to have crawled. He said he had had no difficulty in maintaining the brake-pipe pressure and there was nothing to indicate a leaky train line and, in his opinion, the accident was due either to lack of retaining power or to

excessive tonnage per car brake. It further appeared from Engineman Holland's statement that he had said nothing to the conductor about the air-brake clearance card received at Barstow showing that the brakes were cut out on two cars.

The statements of Conductor Frazier as to the handling of his train en route to Summit practically agreed with those of Engineman Holland. According to the conductor's further statements, after coupling the train together at Summit, the only test of the air brakes made, or required to be made, was an application by the engineman with a brakeman standing at the rear of the train to see if the brakes applied on the last car. In this particular case, however, Conductor Frazier said Head Brakeman Hamlin was about five or seven car lengths from the head end, he himself was in the middle of the train, and Flagman Highwood was at the rear end. The retaining valves were then turned up and the train departed, Conductor Frazier boarding the caboose as it passed him, at this time he noticed that a brake beam was rubbing against a wheel under the car immediately ahead of the caboose, went inside the caboose, noted that the brake-pipe pressure was 80 pounds, according to the gauge in the caboose, and as soon as the curvature of the track permitted, he signalled the engineman to stop. The train was then moving at a speed of 8 miles an hour and was brought to a stop within a distance estimated by him to have been about six car lengths, at which time the entire train was on the 3 per cent descending grade. After the brake beam had been wired up the train again proceeded and he noticed that the brake-pipe pressure was about 80 pounds at that time. When the speed had increased to about 18 or 20 miles an hour he noticed a 15-pound reduction, which was effective and reduced the speed to about 12 or 15 miles an hour, when the brakes were released. The speed increased immediately and after traveling a short distance the engineman made a 25-pound application from an 80-pound brake-pipe pressure. Conductor Frazier estimated the time between the release of the first application and the making of the second application at a minute or minute and a half, although he estimated the distance traveled by the train between the two applications to have been only 10 or 15 car lengths. This second application did not seem to retard the speed of the train and was followed immediately

by a 10-pound application, very shortly after which there was an emergency application, at which time the speed was still 18 or 20 miles an hour. None of these last applications seem to have had any effect and Conductor Frazier said he at once set the hand brake on the caboose, then went out on the first car ahead of the caboose and found the hand brakes already set on the three rear cars. He met the flagman on the third car from the caboose, and they then doubled on the brakes on those three cars, the fourth car ahead being a flat car containing a dredger around which he felt they could not pass in safety at the speed at which the train was running, saying it had increased to 30 or 35 miles an hour at this time. While on top of the train he could see a lantern on the head end of the train, apparently belonging to the head brakeman, and he supposed the brakeman was also setting hand brakes, he had not heard the engineman whistle for brakes. Conductor Frazier estimated the speed at the time of the derailment to have been from 60 to 30 miles an hour. In response to questions as to the condition of the air brakes on his train, Conductor Frazier said that the wheels on the three rear cars were cool after the accident, while the caboose wheels were not, that the brakes on the cars were tested before they were hauled back to Summit, and that the piston on one of the cars went out the full length, while on another the piston travel was 9 or 10 inches, and 8 or 9 inches on the third car. Under rule 874, of the Rules and Regulations of the Atchison, Topeka & Santa Fe Railway, where inspectors are employed at terminals they will fill out an air-brake clearance card in duplicate and give it to the engineman and conductor at the conclusion of the inspection, but Conductor Frazier said it was not customary at Barstow to furnish a copy of the air-brake clearance to the conductor and that he did not have a copy on this occasion, and he did not know that the air brakes on any of the cars in the train were out out.

Flagman Highwood saw the car men working on the train before it left Yermo, but did not know what the condition of the air brakes was leaving that point. He said that the brakes were not tested after the helper engine had been cut into the train at Victorville, and that it was not customary to make such a test, although one is required by the rules. He also said that he cut out the brakes on the fifth car ahead of the caboose, but did not say anything about it until after the accident. Flagman Highwood was riding on top of the train when it proceeded after the brake beam had been repaired,

and said the train seemed to him to drift for some distance and then its speed was reduced from 20 miles an hour to about 12 miles an hour, at which time the brakes were released. The retainers on the rear of the train did not seem to be holding and the speed increased immediately. He did not notice any application of the air brakes after this time, and as the speed increased he began to set hand brakes on the third car from the caboose and then started for the second car, at about which time the conductor came out of the caboose and said that the brake-pipe pressure was gone. He and the conductor completed the work of setting the hand brakes on the three rear cars and then went to the caboose, where they remained until the accident occurred. Flagman Highwood also said he could feel the slack running into the train while they were repairing the brake beam, and thought the engineman might have been holding the train at that point with the independent brake, or a few hand brakes set on the head end of the train. Flagman Highwood said he had never seen an air-brake clearance card furnished by the inspectors at Barstow.

Car Inspector McDonald, located at Yermo, said he coupled the air brakes and turned up the retainers, working from the rear end to the head end, after which the brake-pipe pressure was pumped up and an application of the air brakes made; he then worked the train from the head end back to the middle of the train, where he met Inspector Beachemin, who had been working the train from the rear end, he said he adjusted the piston travel on two or three cars to an average of six or seven inches. The brakes were then released and a second application made, the retainers being turned down after a wait of one minute; adjustments were then made to the retainers on three cars. A period of 27 minutes was consumed in the testing and inspection of this train, but he said that a majority of the cars had been previously inspected at the time of their arrival at Yermo at about 11.20 a.m. The statements of Car Inspector Beachemin, who inspected the rear portion of the train, added nothing to those of Car Inspector McDonald except that he said a test of the brake-pipe leakage showed it to be  $4\frac{1}{2}$  pounds per minute. Neither of these inspectors could account for the excessive piston travel found on the three rear cars after the accident.

Car Foreman Greiner, located at Yermo, said the instructions were that all trains were to have 100 per cent of the air brakes in operation and the same percentage applied to the retainers, and he did not believe that any train was permitted to depart without the air brake equipment being in this condition. He further stated that there is no method of informing engineman as to the condition of the air brakes before the departure of the train, while Inspector McDonald said that when an inspection is completed they merely give the engineman a hand signal.

D.J. Stubbs, Foreman of Car Inspectors at Barstow, said the instructions were to issue an air-brake clearance card to the engineman and conductor of each train, but that he did not know of any conductor who had received such a card. On learning of the accident he made inquiry of the inspectors and was informed that a card had been left in the clip board on the engine, that the train had been given the usual inspection, and that all the brakes were operative, although Inspector Wheeler told him two of the retainers would not hold. Foreman Stubbs further stated that Los Angeles & Salt Lake crews usually leave their trains on arrival at Barstow, and that the air brake test is made in their absence by the car men.

Car Inspector Wheeler said extra 6035 was left with the air brakes set and that he inspected both sides of the first 10 cars in the train, this inspection being for defects in the running gear, he noted, however, that the piston travel was in good condition. After meeting Inspector Wenner, who inspected the rear portion of the train, he was told that that part of the train was in good condition and then filled out an air-brake clearance card saying that the air was working properly on 25 cars and placed it in the clip on the engine, although, according to his own statement, no test was made of the air brakes or retainers. He denied Foreman Stubbs' statement that two of the retainers were defective. It further appeared from his statements that formerly it was the custom at Barstow to test the retainers, but that this was not being done at the present time except with Atchison, Topeka & Santa Fe trains, which are inspected before the road engine is coupled to the train, the yard line being used for the air-brake test. Since the occurrence of this accident, instructions had come from Foreman Stubbs to test retainers.

Car Inspector Werner said he inspected the engineman's side of the train from the engine back ~~of~~ <sup>to</sup> the caboose, and then on the opposite side from the caboose to a point about midway the train, where he met Inspector Wheeler. The train was in good condition and all air brakes remained set until he reached the fireman's side of the train, by which time the brakes on several of the cars had leaked off.

Car Repair Foreman Erzinger, located at San Bernardino, said the first car ahead of the caboose when it reached the repair track needed repairs as follows: Broken tension rod, two brake beams to be changed, and one brake hanger broken and one to be straightened, this car had no braking power. The second car ahead of the caboose needed to have a brake beam changed and one pair of wheels changed on account of a vertical flange, the braking power on this car was all right. As to the third car ahead of the caboose, he said the piston travel might have been a little longer than it should have been, while one of the brake beams had to be changed, he thought however that the air brakes on this car would do their proper share of the work. He also said the piston travel was usually attended to by the air brake foreman. Air Brake Repairman Probst said that on the first of these cars the retainer would not hold, on the second the cylinder needed to be cleaned, the last cleaning having been on September 22, 1922, while there was no braking power on one end of the third car. The piston travel on these cars was 7, 7½ and 9 inches, respectively.

#### Conclusions.

This accident was caused by the train running away on a heavy descending grade.

On account of the lack of proper inspection and test, it is impossible to determine definitely the exact condition of the air-brakes at the time of the accident and this uncertainty is added to by the conflicting nature of such evidence as is available. The stopping of the train on the grade for the purpose of making repairs, coupled with the burned condition of a great many of the wheels after the accident, indicates, however, that the air-brakes probably were in such condition that the speed could have been controlled had they been



properly manipulated by Engineman Holland. The evidence is so conflicting, however, that it is impossible to say just how the engineman handled the train. He said that after proceeding from the point where the repairs were made the speed had increased to only 3 or 4 miles an hour when he made a 40-pound reduction, such a reduction at this rate of speed undoubtedly would have stalled the train, on the other hand, if the conductor's estimate that the speed was 15 or 20 miles an hour when the first application was made is correct, then it is possible the engineman allowed the train to attain too high a rate of speed before he commenced braking, although both conductor and flagman say there was a reduction in speed following the first application of the air brakes.

Rule 873, of the Rules and Regulations of the Operating Department, reads as follows:

'When the engine is detached, or train is cut between air cars, or parts, or when cars are added, the brakes must be tried from the engine before proceeding. "

Time-table rule 24 reads as follows:

"Rule 876 In making this test one of the trainmen will watch last car in train and if brakes apply and release properly, proceed signal may be given. Trains must be stopped and this test made on all trains immediately before departure from Summit "

The evidence clearly shows that the inspection and test of air brakes in this territory is not sufficient for the operation of trains over heavy mountain grades in safety. While it appears that an inspection and test is made at Yermo, on the tracks of the Los Angeles & Salt Lake Railroad, a train of that railroad only receives what amounts to a running inspection when it reaches the tracks of the Atchison, Topeka & Santa Fe Railway at Berstow, yet the engineman and conductor in charge of the train are required to be furnished with an air-brake clearance card which purports to give these employees accurate information as to the condition of the air brakes. Not only is the information thus given apt to be inaccurate, in view of the lack of a proper test, but even this sort of information is not furnished the conductor, a practice having developed of furnishing

only one copy of the air-brake clearance, for the engineman's use. The distance from Barstow to Summit is 56.2 miles, and within this distance this train was cut on three different occasions, once to pick up some cars at the head end of the train, once to cut in a helper in the rear portion of the train, and once to cut out the helper at Summit. No test of the air brakes was made on the first two occasions, while on the third occasion the only test made, or required to be made under the rules above quoted, was the application of the air brakes by the engineman for the purpose of having the flagman or conductor see if the brakes applied on the last car in the train, such a test only shows whether the train line is coupled. The distance from Summit to San Bernardino is 25.4 miles and there is a heavy descending grade over a substantial portion of this distance. The operation of trains on grades of this character requires the maintenance of a thorough system of inspection and test. Not only is there no adequate system, but the failure of the crew to make any tests after picking up cars or putting in a helper, and the failure of the inspectors at Barstow to provide conductors with a copy of the air-brake clearance card, indicate that even such precautionary measures as are provided for are not enforced by the officials or obeyed by the employees. There is no excuse for the existence of such lax operating methods, and responsible officials of this railway should take immediate steps to remedy this dangerous situation.

Engineman Holland was employed as a fireman in February, 1911, was in the military service from December, 1917, to January, 1919, and was promoted to engineman in December, 1923, nearly all of his experience had been in the territory in which this accident occurred. The fireman had had 3 years's experience, while the other members of the crew had been in the service 10 years or longer. At the time of the accident these employees had been on duty about 8 hours, previous to which the train crew had been off duty about 9 hours and the engine crew about 12 hours.

Respectfully submitted,

W. P. BORLAND.

Director.