INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY NEAR CLAY CENTER, KANS., ON SEPTEMBER 27, 1929.

January 18, 1930

To the Commission:

On September 27, 1929, there was a derailment of a passenger train on the Chicago, Rock Island & Pacific Railway near Clay Center, Kans., which resulted in the injury of 24 passengers and 3 employees.

Location and method of operation

This accident occurred on the Clay Center Line of the Kansas Division, which extends between McFarland and Belleville, Kans., a distance of 104.1 miles, and 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 approximately 3 miles west of Clay Center, approaching this point from the west the track is tangent for a distance of 1,631 feet, and for some distance beyond that point, while the grade at the point of accident is 0.10 per cent descending for eastbound trains. The maximum speed permitted for passenger trains is 50 miles per hour.

The track is laid with 85-pound rails, 33 feet in length, with an average of 20 treated ties to the rail-length, fully tie-plated, and is ballasted with crushed rock, gravel, and cinders, to a depth of about 14 inches. In the vicinity of the point of accident the track is laid on a fill 3½ feet in depth; the track is fairly well maintained.

The weather was clear at the time of the accident, which occurred at about 12.55 a.m.

Description

Eastbound passenger train No. 224 consisted of one mail and baggage car, one baggage car, one coach, two Pullman sleeping cars, and one coach, all of steel construction except the baggage car, which was of steel-underframe construction, was hauled by engine 970, and was in charge of Conductor Shafer and Engineman Fisher. This train departed from Clyde, 21.9 miles from Clay Center, at 12.22 a.m., seven minutes late, and was approaching Clay Center when it was derailed while traveling at a speed estimated to have been between 40 and 50 miles per hour.

The engine came to rest 980 feet from the point of derailment, with its tender derailed. All of the cars in the train were also derailed, the first and second cars remained coupled to the engine, the third and fourth cars were overturned on their right sides on the south side of the track, being separated from each other by a distance of 225 feet, while the fifth and sixth cars remained upright and on the roadbed.

Summary of evidence

Engineman Fisher stated that he was operating his train normally and that nothing unusual occurred until he felt a surge of the engine and upon looking back he observed that the tender was off the track, whereupon he immediately applied the brakes in emergency, it was his opinion that the forward truck of the tender was the first to derail, but his inspection of the tender brought out nothing that could have contributed to the derailment. He estimated the speed of the train at the time of the accident at 45 miles per hour, which is the usual rate of speed for passenger trains in that vicinity. He also said that he had operated the engine involved in the accident on several occasions recently, the last time being with westbound train No. 25 during the afternoon prior to the accident, and upon arrival at Belleville at that time he inspected the engine but did not find anything wrong with it, nor had he noticed any unusual motion of the engine in the vicinity of the point of accident during that prior trip.

Fireman Lee stated that the tender was filled with water at Clyde and that the train had been running smoothly, there being no indication that the tender was not riding freely. At the time of the accident he was putting in a fire and his first intimation of anything wrong was when he noticed the tender suddenly lurch to the right, as though it had encountered a low spot in the track, and it then began to surge violently. He thought the train was running at a speed of between 40 and 45 miles per hour at the time of the accident, which was not any faster than the usual speed in that territory. He made an inspection of the engine after the accident but found no parts missing.

Conductor Shafer stated that he had not noticed anything unusual in the movement of the train prior to the accident. The train was running at the usual speed of 45 or 50 miles per hour when the car in which he was riding, the third car from the engine, became derailed, overturning shortly afterwards. As soon as he had ascertained the condition of the passengers, and had taken action to send the most seriously injured to the hospital, he examined the equipment, but could not find anything that could have caused the accident. Some of the brake beams were down, but he thought this was a result of the accident. He also examined the track to the rear of the derailed equipment

and found a flange mark on top of the rail and also on the ties. He could not determine what part of the train was first to derail, but was of the opinion that it was ahead of the car in which he was riding. The statements of Brakemen Stanly and Studebaker added no additional facts of importance.

Section Foreman Grover stated that as soon as he learned of the accident he called the section laborers and proceeded to the point of derailment, where he found the track to have been considerably damaged. He made no examination to determine what caused the accident, but did place his level board on the track about three or four rail-lengths west of the point of derailment and found one of the track rails 1 inch low. He immediately raised this portion of the track but did not thoroughly tamp the ballast at the time; this was the first track work he had done at this particular place for approximately one month. He also said that at the point where the derailment occurred, there is a soft spot under the track, and during wet weather it requires more work than at other points on his section. It had been his practice to patrol his section daily, but he did not do so on the day prior to the accident as he was occupied at another point, and as there had been no rain recently, he did not think there would be any difficulty.

Roadmaster Simsabaugh stated that on September 23 he walked over and inspected the track in the vicinity of the point of accident, he rode over it on September 24 and again on September 26, the latter trip being about 2 hours and 45 minutes before the occurrence of the accident, and during these trips he noticed no unusual track conditions. On his arrival at the scene of accident, he found the north rail still on the fill, but the south rail had been entirely forced off of it and the track torn up for approximately 750 feet. Two broken rails were among the debris, but one of these had been originally located about 6 rail-lengths and the other about 10 or 12 rail-lengths east of the initial point of derailment. He measured the track just west of the first mark of derailment and discovered that the north rail was about one-half inch low, and the section foreman informed him that this rail had been raised 1 inch subsequent to the accident; before the roadmaster made his measurement, however, the engine of the work train has passed over this spot and apparently had caused the track to settle again to some extent. It was the opinion of Roadmaster Simsabaugh that this low spot in the track was not sufficient to cause excessive roll of an engine tender at a speed of 45 miles per hour, but from the distance the equipment traveled after it became derailed, and from the damaged condition of the track, he judged that the speed was greater than 58 miles per hour at the time of the accident, and that this high rate of speed, coupled with the low place in the track, caused the tender to derail.

Roadmaster Sinsabaugh described the fill at the point of accident as being from 3½ to 4 feet in depth, constructed of top soil taken from along the right of way, which is composed more or less of gumbo. This subgrade was covered with rock, then some gumbo, and then cinders to a depth of from 14 to 18 inches. He further stated that on the Clay Center line there are spots which are termed "mud holes", and which range in distance from one-half to six rail-lengths, one of these being at the point of accident. The material in these mud holes is of spongy clay and is subject to shifting, especially after heavy rains. There had not been any heavy rains, however, in this particular locality since June, and to his knowledge the track had been holding very well.

Engine 970 is of the Pacific 4-6-2 type, and has a total weight, engine and tender, loaded, of 467,500 pounds. The tender is equipped with splash plates, and had a capacity of 16 tons of coal and 10,000 gallons of water, at the time of the accident it was nearly full of water. An inspection of this engine and tender subsequent to the accident revealed that the flanges and treads of the wheels were in good condition, and there were no defects noted that could have contributed to the occurrence of the accident.

The first mark of derailment was a flange mark on top of the gauge side of the south rail, which continued diagonally across the rail for a distance of 26 feet to the point where flange marks first appeared on the ties, these marks continuing diagonally across the ends of the ties until the wheels finally left the roadbed. Corresponding flange marks appeared on the ties on the inside of the north rail, and beyond these marks the track was torn up for a distance of about 750 feet.

Conclusions

This accident is believed to have been caused by uneven track, resulting in its being unsafe for the operation of trains at high rates of speed.

The investigation developed that subsequent to the accident the section foreman found that the north rail was 1 inch low at a point a short distance west of where the first flange mark appeared on the running surface of the south rail. The engineman and fireman said their first knowledge of anything wrong was when they felt a surge of the engine and then they discovered that the front end of the tender was derailed, the engineman immediately applying the brakes in emergency. In view of these statements, and in view of the distance the train traveled with the brakes applied in emergency, coupled with the track being torn up for a considerable distance, it seems probable that the train was traveling close to the maximum permissible speed of 50 miles per hour, if in fact this speed was not being exceeded, and that when the tender encountered the depres-

sion in the track it caused it to sway to such an extent that it lifted the right forward tender-truck wheels from the rail and the resulting rebound caused the flanges to drop on top of the rail, leading to the derailment of the train.

Several trains passed over point of accident within the 24 hours preceding its occurrence, and if the depression had existed during this time, it would appear that some of the employees on these trains would have discovered and reported it. Roadmaster Sinsabaugh rode over it on train No. 39 about 2 hours and 45 minutes prior to the accident and did not observe any unusual condition, and the train sheet did not record any train movement over this place after train No. 39 passed and before train No. 224 was derailed, so it is possible that the depression originated after train No. 39 passed over it, due to the slippery and shifting condition of the gumbo soil of which the roadbed is constructed. Examination of the records covering tender derailments on the Kansas Division disclosed that seven others had occurred at comparatively recent dates, all of which involved tenders of the convertible Vanderbilt type, the same as the one involved in this accident; six of these occurred on the Clay Center Line. The cause of one was not definitely determined, but the others were due to track defects. The statements of officials of this district indicate that the gumbo soil of which the road bed is constructed, is of a slippery character and subject to shifting with deterrent effect to the track. Furthermore, it appears that there are other points on this district at which the slippery and shifting character of the road bed is similar to that prevailing where the present accident occurred, and as these points are known it calls for frequent attention to avert a possible similar derailment. The files of this company record numerous tender derailments on this district, during the last 22 months, a majority of which are attributable to track irregularity, and this further emphasizes the necessity of more vigilance in track maintenance.

The employees involved were experienced men and at the time of the accident none of them had been on duty in violation of any of the provisions of the fours of service law.

Respectfully submitted,

W. P. BORLAND,

Director.