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 HARRELL, ARK., SEPTEMBER 28, 1924.

October 28, 1924.

To the Commission:

On September 28, 1924, there was a derailment of a passenger train on the Chicago, Rock Island & Pacific Railway near Harrell, Ark., which resulted in the death of one passenger, and injury of one passenger, three employees and one news agent.

Location and method of operation

This accident occurred on that part of the Second District of the Arkansas-Louisiana Division extending between Haskell and El Dorado, Ark., a distance of 100.9 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 derailment occurred at a point 4.6 miles east of Harrell, approaching this point from the west the track is tangent for more than 1 mile. The grade for eastbound trains is 0.253 per cent descending for 1,800 feet and is then 0.6 per cent descending to the point of accident, 3,200 feet distant. The track is laid with 80-pound rails, 30 feet in length, even joints, with about 18 ties to the rail-length, single-spiked and tie-plated. It is generally ballasted with about 10 inches of gravel, but in the cut where the first wheels were derailed the track is ballasted with cinders to a depth of about 2 feet, the track is on a fill at the point where the derailed equipment stopped after the accident. The speed of passenger trains is restricted to 40 miles an hour. The weather was clear at the time of the accident, which occurred at 7 50 a.m.

Description

Eastbound passenger train No. 636 consisted of one baggage car, one coach, and two chair cars, all of wooden construction, hauled by engine 1018, and was in charge of Conductor Dixon and Engineman O'Laughlin. It left El Dorado, its initial terminal, at 6 30 a.m., on time, left Harrell at 7.37 a.m., seven minutes late, and was derailed at a point 4.6 miles east of Harrell at 7.50 a.m., while traveling at a speed estimated to have been between 35 and 40 miles an hour

Engine 1018 stopped about 1,080 feet east of the first marks of derailment, upright on the rails, undamaged, the tender and all the cars were derailed, the last two cars and the tender remaining upright on the roadbed The first and second cars were derailed to the left, the first car remained coupled to the tender, with its rear end down the fill about 27 feet from the track, the second car came to rest on its left side at the bottom of the fill, parallel with and about 27 feet from the track, badly damaged.

Summary of evidence

Engineman O'Laughlin stated that the air brakes were tested at El Dorado and had worked properly en route, no difficulty being experienced in making the seven stops between the initial terminal and the point of accident. As his train encountered the descending grade approaching the point of accident he shut off steam and was working a light drifting throttle when the engine started to "swing", he applied the air brakes in service application to steady the train and at about the same time looked backwards to ascertain the cause of an unfamiliar noise, saw gravel and dirt flying from under the tender and applied the air brakes in emergency The engine traveled about 30 rail lengths before it came to a stop, which Engineman O'Laughlin said was a very good stop considering the descending grade and speed of the train at the time, which he estimated to have been between 35 and 40 miles an hour He had noticed no unusual condition of the track as his train approached the point of accident and his examination both of the track and of engine 1018 disclosed no condition that would have caused the derailment. He was of the opinion, however, that the derailment was caused by the front tender truck rocking off the rails Engineman O'Laughlin also said he had run engine 1018 regularly for several months, that it compared favorably with the other engines, and that it was in good condition on the day of the accident.

The statements of Fireman Bennett practically corroborated those of Engineman O'Laughlin and added nothing of importance to the evidence

Road Foreman of Engines Robinson stated that he got on engine 1018 at Calion to observe the result of some changes that had been made in the draft appliances on the engine and was riding on the fireman's seat box at the time of the derailment. As the train was approaching the point of accident the engine and tender began to rock and the engineman applied the air brakes in service application to steady the train, the engine and tender seemed to straighten out but the engineman, a few seconds later, put the brake valve in the

emergency position, it being evident at that time that the front tender-truck wheels were off the rails He said he later made an examination of the engine, tender and trucks of the derailed cars but found nothing that would have caused the derailment. At the rear of the last car in the train as it had stopped after the accident he found the left rail had turned over and had broken or sheared the angle-bar bolts, permitting the cars to leave the road bed Several rail lengths west of the first mark of derailment he found two or three low spots in the track. Road Foreman of Engines Robinson was of the opinion that these low spots in the track, coupled with the speed of the train, which he thought was about 40 miles an hour, caused the tender to rock to such an extent as to result in the tender-truck wheels mounting the rails and cause the subsequent derailment of the train.

The first mark of derailment appeared on the running surface of the north rail, apparently caused by a wheel flange. It extended for a distance of 17 feet 6 inches to where the wheel dropped off the rail on the outside, a similar wheel mark appeared on the inside of the right rail. These marks continued eastward a distance of 701 feet 6 inches to where the angle-bar bolts at a joint in the north rail were sheared off, the joint broken, and the following rails pushed off the ends of the ties, apparently it was at this point that the cars in the train were derailed. The south rail was not displaced or otherwise disturbed.

There were three low joints immediately west of and within five rail-lengths of the first mark of derailment The first of these low joints, as encountered by train No. 636 moving eastward, was in the south rail and the next two were in the north rail, three and four rail-lengths, respectively, east of the first low joint. The gauge, surface, and alinement of the track were carefully checked for a distance of 400 feet west of the first mark of derailment, and with the exception of the three low joints above noted, they were found to be in good condition. Investigation further developed that the cuts in this vicinity are more or less damp, and those portions of the track extending through them require more attention in rainy weather, it is on this account that so much cinder ballast is used in the cut at the initial point of derailment, and in digging into the ballast water was found at a depth of 9 inches below the ties. It further appeared that there had been considerable rain in this locality during the preceding night.

Roadmaster Carpenter said he did not recall having had a derailment on this section, that no slow orders were in effect, and that he was of the opinion the track was in good condition and safe for a speed of 40 or 50 miles an hour; he had been over this section of track with a motor car on several occasions recently and also rode over it on the evening prior to the accident. He thought the accident was due to the rocking of the tender and the application of the air brakes at the same time, and that the rocking of the tender was due to slight low spots in the track coupled with the movement of water and oil in the tender. Roadmaster Carpenter also said he thought the low spots were not due to the rain during the night, but that they were present probably when he rode over the track the previous evening, and that they were not sufficient to warrant the issuing of slow orders.

Section Foreman Gay said he had some trouble with seeping water in the cuts, on account of the gumbo formation, which slides in wet weather, and that during the rainy season it is necessary to pay extra attention to the track through the cuts. About 15 carloads of gravel had been dumped in this vicinity and leveled to a point 4 inches above the ties, this condition prevailed at the initial point of derailment, and Section Foreman Gay said it was to be used in ballasting and raising the track, as during rainy weather the ballast is forced down into the gumbo and works upward several feet from the ties. He thought the track was safe for a speed of 40 miles an hour, although he said the accident might have been due to some slight "swings" or low spots in the track, coupled with the application of the air brakes as the engineman started to reduce speed

Engine 1018 is of the 4-4-2 type, burning oil, having a total weight, without tender, of 186,300 pounds, examination of the engine showed it to be maintained generally in good condition. The tender is of the rectangular type, being a converted coal-carrying tender, and has a capacity of 7,000 gallons of water and 3,200 gallons of fuel oil, weighing 136,500 pounds when loaded The wheel base of the tender is 19 feet 2 inches, while the height from the top of the rail to the top of the fuel oil tank is 12 feet 2 inches. The tender trucks are of the arch-bar type, equipped with three-section elliptical springs. The side bearings are applied to the ends of the truck bolsters and have a spread of 7 feet 4 inches from center to center. On the front truck the forward pair of wheels were 36 3/8 inches in diameter and the rear pair 34 inches in diameter, while the distance from the right front box bolt to the left rear box bolt was $\frac{1}{2}$ inch more than the corresponding distance between the left front and the right rear box bolts. The right front and the left rear side bearings showed signs of wear, while the other two

side bearings showed signs of occasional contact only, there being no signs of wear. The tender itself leaned slightly to the right, at the time of this examination the fuel oil tank was within 6 inches of being full and the water tank was about half full, while Engineman O'Laughlin estimated that at the time of the accident the water tank was about three-fourths full and the oil tank nearly full. The water cistern is equipped with splash sheets applied crosswise, none are applied longitudinally, while there are no splash sheets used in the fuel oil tank. Engine 1018 had received class 3 repairs in May, 1924.

Conclusions

This accident is believed to have been caused by the rocking of the tender as a result of the lateral surge of water and fuel oil due to unevenness in the track and the speed at which the train was being operated.

Examination of the equipment failed to disclose any condition which it is believed could have caused the derailment. Examination of the track showed the presence of a few low joints, none of them excessive, but apparently sufficient, when coupled with the fact that the speed of the train was about 40 miles an hour, the maximum rate allowed on this subdivision, to cause the tender to rock to such an extent as to permit the left front tender-truck wheel to mount the rail.

The employees involved were experienced men, at the time of the accident they had been on duty nearly 3 hours, after about 10 hours off duty.

Respectfully submitted,

W. P. BORLAND,

Director.