INTERSTATE COMMERCE COMMISSION.

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REPORT OF THE CHIEF OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE DELAWARE, LACKAWANNA & WESTERN RAILROAD NEAR APALACHIN, N.Y., ON SEPTEMBER 3, 1921.

October 13, 1921.

To the Commission:

On September 3, 1921, there was a derailment of a passenger train on the Delaware, Lackawanna & Western Railroad near Apalachin, N.Y., which resulted in the death of 1 passenger, and the injury of 69 passengers and 9 employees. This accident was investigated in conjunction with representatives of the Public Service Commission of the State of New York.

Location and method of operation.

This accident occurred on that part of the Scranton Division extending between Binghamton and Elmira, N Y., a distance of 56.99 miles; 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 0.88 mile west of Apalachin. Approaching the point of accident from the east there is a long curve to the right, followed by 163 feet of tangent, and a compound curve to the left 1,460 feet in length, with a maximum curvature of 3° 30'; then about 1,384 feet of tangent, the derailment occurred on the last mentioned tangent; about 100 feet from the western end of the curve, at which point the grade is level. The track is laid with 105-pound rails, 33 feet in length, with an average of

about 20 treated oak ties to the rail-length, ballasted with washed gravel about 18 inches in depth. Tie plates and screw spikes are used, the gauge side of the low rail on curves being double-spiked. The weather was cloudy at the time of the accident , which occurred at about 4.30 p.m.

Description.

Westbound passenger train second No. 3 consisted of 1 mail and baggage car, 2 buffet cars, 2 dining cars, and 4 Pullman sleeping cars, in the order named, hauled by engine 1107, and was in charge of Conductor Walsh and Engineman Bookhamer, The cars were of all-steel construction with the exception of the fourth and eighth cars, which were of steel-underframe construction. This train left Binghamton at 4.01 p.m., 36 minutes late, passed Apalachin at 4.18 p.m , 37 minutes late, and was derailed while running at an estimated speed of 45 miles an hour.

Engine 1107 and its tender came to rest on their right sides approximately 590 feet beyond the point of derailment, the engine truck was found 240 feet west of the engine, the leading wheels resting on the rails of the eastbound main track. The first car came to rest on its right side, in the rear and to the right of the tender, while the second car was immediately behind the tender in an upright position; the third, fourth, and fifth cars, and the front truck of the sixth car were derailed but remained upright.

Summary of evidence.

Engineman Bookhamer said he saw or felt nothing

unusual until the front end of the engine swerved to the right, as though it had struck a kink in the rail; at this time he was using a little steam, and he said he shut off steam and started to apply the brakes, but was not certain whether or not this was accomplished. He estimated the speed of the train to have been between 40 and 45 miles an hour. Engineman Bookhamer thought the track was thrown out of alignment and the rails spread by his engine or the preceding train. Fireman Chris stated that the engineman succeeded in making an emergency application of the brakes, but was unable to reach the throttle. He thought either the engine truck was broken or the track gave way; in other respects his statements corroborated those of the engineman.

None of the members of the train crew noticed anything unusual previous to the accident, nor did they recall any application of the brakes having been made between Binghamton and the point of accident. Conductor Walsh was of the opinion that the track slid out from under the engine, due to a previous heavy rainfall on new ballast. On going back to flag immediately after the derailment, Flagman Downing noticed the track out of alignment just east of the rear end of the train, he did not see any flange marks on the ties.

Master Mechanic Davis made an examination of the derailed equipment and found nothing that would have contributed to the accident. He thought track conditions permitted the engine to swerve and resulted in the derailment. Traveling Air Brake Instructor Langan also examined engine

1107, but was unable to find anything which could have caused the accident.

Inspection of the track disclosed that the first wheel marks appeared on a tie on the gauge side of the right rail The first mark on the opposite side of the track appeared on a tie outside the left rail, at a point about 17 feet west of the first mark on the right side, these marks gradually extended to the left for a distance of 230 feet, at which point the mark on the left side disappeared at the ends of the ties and the track was torn up. At a point about 88 feet west of the first mark, there was another wheel mark on the gauge side of the left rail and a corresponding one a few feet farther west on the outside of the right rail, these marks extended diagonally to the right until lost in the general derailment. The roadbed was demolished for a distance of about 400 feet.

Section Foreman Hovley was in charge of work being done in the vicinity of the point of accident; on the day of the accident the work had consisted of raising the track from 3 to 3-1/2 inches, and tamping, surfacing and lining the track. While this work was being completed for the day, he motioned to the work train foreman to dump one car of ballast at about the point of derailment; at this time the work train, containing 14 cars of ballast, was on the eastbound track and in order to dump ballast at the place designated on the westbound track it was necessary to proceed to Apalachin and make a switching movement. While this movement was

being made, a heavy rain came up and the section foreman and his gang took shelter under a bridge and were still there when the work train returned. It was then raining hard and instead of stopping to dump one car, the work train proceeded to a point a short distance to the west, where the entire 14 cars could be dumped, but after dumping 10 it had to proceed on account of being close to the time of train No 3. After the storm subsided, the section foreman examined the track before leaving it for the day and found it to be in good condition in every particular. He was careful to know it was in good condition, as the next two days were holidays and no work would be done; he did not think the failure to have the extra car of ballast at that point made any difference in the safe condition of the track.

Shortly after the accident occurred, General Superintendent Shepard took measurements of the track in regard to alignment, using the center of the eastbound track, which was not disturbed, as a base, beginning at a point in advance of the point of derailment and proceeding westward, measuring each joint. The normal distance between track centers is 13 feet, while these measurements showed the distance between track centers to be as follows: 13'; 13', 13' ½"; 13' 1¼"; 13' ¾"; 13' 1½"; 13' 4", 13' 3", 12' 9", 12' 7¾", 13' ¾"; 13' 11 5/8"; 13' 6¼" and 13' 7½", this last being the point of derailment. West of the point of derailment the first joint was 13' 5¼", the succeeding joints were as follows. 12' 7", 12' 3½", and 12' 9¾", this being about 125 feet west of the point of initial derailment. Mr. Shepard

said it was obvious that if these conditions existed prior to the accident, they were the cause of the accident, as it would be impossible for a train to pass over track in this condition at a speed of anywhere near 40 or 45 miles an hour without being derailed. He also said that the track in the vicinity of the point of accident was not in a finished condition, the ends of the ties in places being devoid of ballast, although the shifting of the track undoubtedly contributed to this condition. Mr. Shepard said washed gravel would not hold as well as broken stone, and in his judgment the track slid out from under the engine.

The first section of train No. 3 passed Apalachin 21 minutes ahead of the derailed train, and during the investigation the theory was advanced that the alignment might have been disturbed by that train, but it could not be ascertained that this was the case. Although a speed of 50 miles an hour was permitted and his train was late on this occasion, Engineman Eldregge, of the first section, said he held the speed down to 45 miles an hour or less, as is his practice in this vicinity, on account of the curves and because the track is a little rough at times.

Conclusions.

This accident is believed to have been due to the track structure not being strong enough for the operation of the train at the speed at which it was running.

The investigation developed that the work of raising, ballasting and replacing ties in the track in the

vicinity of the point of accident had been in progress for several weeks, under protection of a flagman sent out during working hours with instructions to flag all trains. At the conclusion of each day's work, this flagman was withdrawn and there was no restriction of speed other than the speed board on this curve, which limited speed to 50 miles an hour. The indications are that the ballast did not hold and that the track slid out from beneath the train; possibly this occurrence was facilitated by the heavy shower which took place shortly before the accident.

According to the train sheet, train second No. 3 covered the distance between Vestal and Apalachin, 5.31 miles, in 6 minutes, or at an average speed of 59.1 miles an hour. The engineman said the speed of the train was about 45 miles an hour at the time of the accident, and while it is impossible to say that it was materially greater, it is believed that this is a minimum estimate.

All of the employees involved were experienced men. At the time of the accident the engine crew of train second No. 3 had been on duty about 3-1/2 hours and the train crew about 1 hour, previous to which they had been off duty 14 hours or more.

Respectfully submitted,

W. P. Borland,

Chief, Bureau of Safety.