INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE SOUTHERN RAILWAY NEAR LOUDON, TENN., ON NOVEMBER 10, 1927

December 28, 1927.

To the Commission:

On November 10, 1927, there was a derailment of a passenger train on the Southern Railway near Loudon, Tenn., which resulted in the death of one employee and the injury of three passengers and two employees.

Location and method of operation

This accident occurred on that part of the Knoxville Division extending between Knoxville, Tenn., and Chattanooga, Tenn., a distance of 110.9 miles. This is a single-track line over which trains are operated by time-table, train orders and an automatic block-signal system, supplemented by automatic train-control. The accident occurred at a point 1,949 feet west of mile post 103-A, approaching this point, beginning at mile post 108-A, the track is tangent for a distance of 301 3 feet followed by a 1° 54' curve to the right 1033.3 feet in length including spirals, then a tangent 117 3 feet in length followed by a compound curve to the left 1202.7 feet in length with a maximum curvature of 2° 30', the accident occurring in about the center of the last-mentioned curve, where the curvature was at its maximum. The grade in this vicinity is approximately 1 per cent descending for westbound trains. On account of the curve to the left the view of the point of accident had by the engineman of a westbound train is limited to a few hundred feet.

In the vicinity of the point of accident the track is laid with 85-pound rails 33 feet in length, with an average of 20 untreated oak ties to the rail-length, tie-plated, single-spiked on the inside and double-spiked on the outside, and ballasted with chat to a depth of 24 inches, four bolt-hold Weber joints are used to connect the rails. The track is well maintained.

The weather was clear at the time of the accident, which occurred at 6.52 p m.

Description

Westbound passenger train No. 25 consisted of two mail cars, two coaches, one dining car and six Pullman cars, all of steel construction, hauled by engine 1468, and was in charge of Conductor Beets and Engineman Crowell. This train left Knoxville, 38.8 miles from Loudon, at 6 05 p.m , on time, and was derailed near Loudon, while traveling at a speed estimated to have been from 30 to 35 miles per hour.

The engine was derailed to the right and came to rest on its right side at the bottom of a 45-foot embankment. The first four cars and the forward truck of the fifth car were also derailed to the right, the first three cars being overturned. The employee killed was the engineman

Summary of evidence

Fireman Hicks stated that his train was drifting down the grade towards Loudon and he had no intimation of anything wrong until the engine began turning over; he did not know if the engineman applied the brakes but he knew they had been operating properly and that the headlight was burning. He also stated that all the automatic signals between Lenoir City and the point of accident a distance of about 5 miles, were in the proceed position, except signal 1569-A, which is the first signal east of the point of accident, he did not observe the last-mentioned signal because he was down on the deck of the engine and on account of the curvature of the track in the vicinity of that signal it is difficult to see it from the fireman's side. Fireman Hicks also saw a proceed indication displayed by signal 1537-A, the first signal west of the point of accident.

Conductor Beets stated that the train was traveling at a speed of 30 or 35 miles per hour and that his first intimation of the accident was the sudden stopping of the train, he was riding in the eighth car at the time of the accident and immediately proceeded to a telephone about one-half mile distant in order

to communicate with the dispatcher, and it was about 20 minutes later when he made an examination of the track. He found a rail had been disconnected and there were marks on the ties made by the heel of a claw-bar and he also noticed that there were some bolts and three spikes lying on the inside of the rail. He examined the threads of the bolts and found them to be in good condition and not sheared in any way, indicating that they were removed from the joint without strain, and he stated that in his opinion some one had tampered with the track.

The statements of Flagman Wilson brought out nothing of importance as he went back to protect the rear of his train by flag. Baggagemaster Buckles, who made an examination of the track about 30 minutes after the accident, stated that the bolts had been removed, and that the inside angle-bar was lying on the inside of the rail while the outside angle-bar was in place. The statement of Train Porter Johnson substantiated that of Baggagemaster Buckles, except that he said the angle-bar was missing from the inside of the rail.

Track Supervisor Lyon, who has had supervision over this particular territory for the past six months and was a passenger on train No. 25, stated that he was riding in one of the coaches at the time of the accident. Upon alighting from the coach he went to examine the track, noticed a man looking under a car, and was informed about the bolts and spikes. He then assisted the conductor and talked with the dispatcher, and about 25 minutes later he went back to make a detailed examination of the track, and noticed that on the gauge side of the outer rail of the curve the spikes had been pulled from 13 or 14 ties. Track Supervisor Lyon also saw the prints of a claw-bar on several of the ties where the spikes had been pulled out and noted that no spikes had been broken off in the tie plates as would have been the case if the rail had turned under the weight of the engine. At that time he could not find the inside angle-bar but he did notice that the nuts and bolts of the rail joint were lying on the track. In his opinion the accident was caused by the disconnecting of the rail joints on the high side of the curve, pushing the receiving end of the rail immediately west of this joint inward toward the center of the track after first removing the spikes from 13 or 14 ties on the gauge side, and holding the rail in that position

by dropping a spike in the hole on the inside of the tie plate, thereby leaving an opening of 4 or 5 inches between the leaving and receiving ends of the two rails, and allowing the wheels to drop off the leaving end of the rail located immediately east of the joint. The first flange mark on the rail immediately west of the joint appeared on the base of that rail, on the outside edge, at a point about 29½ inches from the receiving end, this mark continued to appear on the base of the rail for a distance of about 20 feet, indicating that the wheels of the engine had run off the end of the delivering rail and then on the outside of the receiving rail until the engine started to leave the roadbed, on the outside of the curve. It further appeared from Mr. Lyon's statements that this rail could have been moved inward 14 or 15 inches without interfering with the bond wire carrying the electric current which actuates the automatic signals and also the train-control device, and Mr. Lyon said that in his opinion an experienced man familiar with the track could disconnect the angle bars, remove the spikes from 14 or 16 ties and push this rail inward as described, in about 20 minutes.

The statements of Section Foreman Smith practically corroborated those of the track supervisor as to the conditions found to exist immediately after the occurrence of the accident. He further stated that the track had been tampered with about two or three weeks previously, the spikes having been removed from 6 or 7 ties at a point between mile posts 156 and 157. He did not observe, increase the vigilance in patrolling the track, this patrol being made every second day. The statements of Sergeant of Police Kerr, of the Southern Railway, who was a passenger on train No. 25, brought out nothing additional of importance.

Master Mechanic Simpson arrived at the scene of the accident at 3:15 p.m. and made an examination of the engine, which had been out of the shop only since November 2, and found nothing which could have caused the accident.

Signal Supervisor Otterbourg stated that he inspected the signals in this territory about four hours after the occurrence of the accident, he found the signal immediately east of the point of accident, and also the train-control inductor, to be in proper

condition and in his opinion the signal system was in perfect working order. He also stated that the bond wire could have been shorter but owing to physical conditions a longer wire was used, and that the rail could be disconnected without affecting the signal system.

Chief Dispatcher Craig stated that eastbound train No. 14, the last train passing the point of accident, left Loudon at 6.23 p.m., on time and should have passed the point of accident at 6.35 p.m., while train No. 25 passed Lenoir City at 6.44 p.m. and was derailed at 6.52 p.m., making a lapse of 37 minutes from the time train No. 14 passed the point of accident until the time No. 25 was derailed.

On November 12 a test was made to determine how long it would take one man to disconnect a rail joint and pull the spikes from the inside of the rail for a distance of 9 ties and then to force the disconnected end of the receiving rail inward toward the center of the track a distance of 5 inches or more and secure it in that position, it required 20 minutes to complete the work, without interfering with the bond wires.

One of the Commission's inspectors, who was a passenger on train No. 25, stated that the first intimation he had of the accident was when he was thrown against the cushion of the seat opposite the one in which he was riding, in the rear car of the train, that he immediately went forward to determine the cause and as he reached the forward end of the dining car he saw that the leading truck of that car was derailed and with the aid of lighted matches he found that the rail joint at this point was disconnected and that the receiving rail was missing. The bolts had been removed from the joint and were lying on the track a short distance from the inside of the rail and also that two or three spikes had been drawn from the ties on the inside of the rail on the high side of the curve and that these spikes had been drawn with a claw-bar as indicated by the marks on the ties. This inspector also noticed that the tie-plates were still in place and were marked by the flange of a wheel where the base of the rail ordinarily would have rested had the rail been in place. These observations were made within a very few minutes after the accident occurred, and probably before any one else had had an opportunity of examining the track.

Conclusions

This accident was caused by malicious tampering with the track.

The evidence clearly indicated that the rail joint on the high side of the curve had been disconnected, that the spikes from 13 or 14 ties on the gauge side of the rail had been removed with a claw-bar, and that the receiving end of the rail had been pushed inward towards the center of the track, being held in that position by dropping a spike in a hole on the inside of the tie plate, thereby leaving an opening of 4 or 5 inches between the leaving and receiving ends of the rails. This allowed the wheels to drop off the leaving end of the delivering rail and to run on the outside of the receiving rail, on the outside of the curve, allowing the engine to leave the roadbed and go down the embankment. This rail could have been moved inward 14 or 15 inches without interfering with the bonding wire, the breaking of which would have caused the automatic signals to display a stop indication and the automatic train-control device to operate so as to bring the train to a stop.

A test was made near the scene of the accident to ascertain how long it would take one man to disconnect a rail joint, pull the spikes from the gauge side of the rail for a distance of 9 ties, and pry the rail inward towards the center of the track and secure it in that position by dropping a spike in a spike hole on the inside of the tie plate, the test consumed 20 minutes. This test was conducted in day-light, which assisted to some extent, while at the time of the accident it was dark, and it seems probable that more than one man assisted in disconnecting the rail at the point of the accident. This person, or persons, no doubt, was very familiar with the schedule of trains on this division as well as with track conditions and automatic signal operation, as only 27 minutes elapsed between the time the previous train passed this point and the time at which this accident occurred, while the work was done in such a manner as not to disturb the track circuits. It had not been determined at the time of this investigation by whom the rail was disconnected.

All of 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 hours of service law.

Respectfully submitted,

W. P. BORLAND,

Director.