

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE LOUISVILLE & NASHVILLE RAILROAD AT PLEASANT VIEW, KY., ON FEBRUARY 13, 1920.

March 12, 1920.

On February 13, 1920, there was a derailment of a passenger train on the Louisville and Nashville Railroad at Pleasant View, Ky., which resulted in the death of 1 employee and injury to 3 employees. After investigation of this accident, the Chief of the Bureau of Safety reports as follows:

The Knoxville Division of the Louisville & Nashville Railroad, on which this accident occurred, is a single-track line over which trains are handled by timetable, train orders and an automatic block signal system. Passenger trains are limited by time-table rule to 50 miles an hour.

The accident occurred at a point about 1 mile north of the station at Pleasant View, approaching which point from the north the track is tangent for about 2,800 feet, followed by a curve to the east about 1,150 feet in length, varying from 4 degrees to 5 degrees 40 minutes with a superelevation of 5 inches; the point of accident being on this curve about 750 feet south of its northern end.

The track in the vicinity of the point of accident is laid with 90-pound rails, single-spiked, with about 20 ties to the rail, and tieplated on curves. It is ballasted with crushed stone and is well maintained, the gauge varied from standard to one-half inch wide. The weather at the time of the accident was clear.

The train involved was southbound passenger train No. 33, known as the "Southland" and was in charge of Conductor Piercy and Engineman Higdon. It consisted of engine 231, 1 mail car, 1 baggage car, 2 coaches, 3 Pullman cars, 1 dining car and 2 Pullman cars, in the order named. This train was due at Pleasant View at 3.10 p.m. and at 3.35 p.m., while traveling at a speed of 45 or 50 miles an hour was derailed about 1 mile north of the station at Pleasant View.

The derailed engine ran on the ties a distance of 435 feet to a switch leading to a siding which serves the New Pleasant View Coal Mine. Upon striking the switch the engine was diverted to the right, collided with a gondola car which was standing on the siding and continued to the coal tipple, a distance of 290 feet beyond the switch, where it turned over on its left side. The gondola car was demolished. The mail car and the baggage car of train No. 33 came to a stop crosswise the track in an upright position. The first coach was also derailed, and came to rest inclined at an angle of 45 degrees. The forward truck of the first sleeping car was also derailed. The employee killed was Engineman Higdon.

The first mark of derailment appeared on the outside or west rail, just north of a road crossing. This mark was a very slight abrasion on the outside of the head of the rail and had the

appearance of some foreign object having scraped the rail when struck. On the running surface of this rail, at the center of the road crossing, there was an indication of a wheel flange having crossed the rail to the outside. Immediately opposite this mark, a wheel on the east side of the train had marked a crossing plank and at the south end of a plank on the west side of the track, marks on the splice bolts indicated where a flange had dropped upon the ties. The nut on the first bolt on the outside of the west rail had an indentation on it, the head of the second bolt had been rubbed, and on the third bolt the head had been sheared off. From this point the marks ran along nearly parallel with the rail, the distance from the rail varying from 4 to 10 inches, until the switch was reached. The wheel on the outside of the west rail struck the edge of a tieplate, while the wheel on the inside of the east rail passed inside the switch point. By the time the derailed wheels reached the frog the track was so badly damaged that the marks could not be followed beyond that point.

Fireman DeLaney stated that approaching the point of accident the engine seemed to be running smoothly. He had been putting in a fire just prior to the derailment and was in the act of getting upon his seat when he felt the trucks leave the rails. He thought the engine at this time was just north of the road crossing. Engineer Higdon immediately made an emergency application of the brakes, but he was not positive as to whether or not he reversed the engine. He estimated the speed at the time at about 40 or 45 miles an hour. He further stated that he did not see anyone on or near the track prior to the derailment, nor did he see any obstruction on the track.

Conductor Piercy stated that he was riding in the third car in the train and felt the brakes applied in emergency just as the wheels struck the ties. He estimated the speed at the time of the derailment at 45 or 50 miles an hour. Prior to the derailment he had noticed nothing irregular in the movement of the train.

Flagman Pinkston estimated the speed of the train at the time of derailment at 45 miles an hour, while Baggage-master Watson estimated it at about 40 miles an hour.

Trackwalker Hatfield stated that he walked over the track where the accident afterwards occurred at about 7.00 a.m. and passed over it again on the return trip, at about 9.30 a.m. On neither of these occasions did he see any children playing in the vicinity, but about 300 yards north of the road crossing he found a tieplate with a stick through the spike hole and he thought that some child had been sliding this along the rail.

Clark C. Stanfill, formerly employed as conductor by the Louisville & Nashville Railroad Company, stated that he arrived at the scene of the accident at about 3.55 p.m., and in the company of Ansil Estes found a piece of iron on the end of a

cross tie about 15 or 20 feet north of the first marks of derailment. He examined this piece of iron and was of the opinion that the derailment was caused by its having been placed on the track.

Roadmaster Stark stated that on his arrival at the scene of the derailment at about 8.30 p.m. he examined the track and saw marks on the rail and ties, the first marks were about 35 feet north of the crossing. After examining the piece of iron he was of the opinion that it had been on the rail and was responsible for the derailment of the train. He measured the track and found that it had an elevation of 5 inches, with a variation of approximately $1/4$ inch within a distance from the point of derailment of 10 rail lengths. The gauge varied from standard to approximately $1/2$ inch wide.

Inspector of Police Bucker, of the Louisville & Nashville Railroad, stated that his investigation developed that the accident was caused by a piece of iron being placed on the track, which he decided was part of a bumper iron off the end of a mining car. He said that it was supposed that a boy six years of age was responsible, although the boy would not acknowledge it. This boy said he had been playing with the piece of iron in the vicinity of the point of accident and he was also seen playing on the track by Francis Thomas, a citizen of Pleasant View. The inspector of police also stated that Fireman DeLaney made a statement to the effect that he saw the boy running away from the track as the train approached, although in his later statement the fireman said he had seen no one on or near the track, as he had been putting in a fire.

The piece of metal found was believed to be either a part of a bumping iron off the end of a mining car or a part of the lining of an old-fashioned brake shoe. It was rectangular in shape, measuring about $6-1/2$ inches long and about 4 inches wide, both sides and one end were flanged. This flange increased in depth from $3/4$ inch at the open end to $1-1/2$ inches at the flanged end. At one of the corners the flange showed a fresh break, but aside from this break the piece of iron bore only very slight abrasions which were obviously made by its scraping along on some hard surface. The inside was partly filled with a carbon substance which appeared to have been pressed by a rail or wheel. There were no pronounced dents or marks which would indicate that the piece of iron had been run over by a train while on the rail.

The elevation of the track at the point of accident did not afford an adequate margin of safety for a speed of 50 miles an hour, which was the maximum speed permitted by time-table rule and which according to Conductor Piercy's statements, may have been the speed of train No. 33 at the time of the accident. Proceeding southward this curve of approximately 1,150 feet consists of a 5-degree curve 220 feet in length, a 5-degree 40-minute curve 333 feet in length, a 4 degree 40-minute curve 200 feet in length and a 4-degree 4-minute curve 403 feet in

length, the first marks of derailment were about at the junction of the two curves last mentioned. The roadmaster stated that he measured the superelevation on this curve and found it to be 5 inches, but according to the recommended practice of the American Railway Engineering Association the superelevation on a curve of 5 degrees 40 minutes if trains are to be operated over it at a speed of 50 miles an hour, should be nearly 9 3/8 inches. With an elevation of only 5 inches the recommended practice calls for a maximum speed of between 36 and 37 miles an hour.

The cause of this accident was not definitely determined, but it is believed to have been due either to excessive speed for the existing superelevation of the curve, or to an obstruction on the outside rail of the curve.

While the statements of the various witnesses point to the assumption that the accident was due to an obstruction, careful examination of the piece of iron supposed to have been the obstruction failed to reveal the presence of such pronounced marks and indentations as naturally would have been made upon it if run over by any of the wheels of an engine or car. On the other hand the rate of speed at which trains were allowed to be operated was too high for the superelevation which existed.

The subject of maximum rates of speed at which trains are permitted to be operated in view of existing superelevation on curves has been discussed in previous reports, particularly in the report covering the investigation of the accident which occurred on the Southern Pacific Railroad near Vincent Calif., on October 29, 1919 and in view of its importance attention is directed to the following statement contained in that report:

" A very large margin must necessarily be maintained between theoretical overturning speeds and the speeds authorized for common practice in order that proper allowance may be made for errors in estimating speed, worn rails and slight imperfections in track or equipment which may not be serious enough to warrant repair or replacement, but which combined materially reduce the factor of safety. The elevation recommended for common practice is designed to provide the necessary margin of safety and no speed should be permitted which is greater than that recommended for the existing elevation and curvature. If it is not desired to increase the elevation on account of heavy grades or for other reasons, or if the required elevation is beyond the dictates of good practice, then the obvious remedy is to reduce the maximum permissible speed accordingly."

The crew of train No. 33 were all experienced men, with good records. The engine crew had been on duty about 1 hour after a period off duty of about 9-1/2 hours. The train crew had been on duty about 8-1/2 hours after a period off duty of about 31 hrs.