

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN  
RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED  
ON THE CENTRAL OF GEORGIA RAILWAY AT ORCHARD  
HILL, G. A., SEPTEMBER 26, 1925.

October 20, 1925.

To the Commission.

On September 26, 1925, there was a derailment of a passenger train on the Central of Georgia Railway at Orchard Hill, Ga., which resulted in the injury of nine passengers and four employees.

Location and method of operation

This accident occurred on the Atlanta District of the Macon Division, which extends between Atlanta and Macon, Ga., a distance of 102.8 miles. Orchard Hill is 48.7 miles east of Atlanta. On this line trains are operated by time-table, train orders, and an automatic block-signal system, it is a single-track line in the vicinity of the point of accident, the maximum speed limit for passenger trains being 55 miles per hour. The derailment occurred at a point 300 feet west of Orchard Hill station, approaching from the west for a distance of approximately 2 miles the track consists of a number of curves and short tangents, there being a curve of  $2^{\circ}$  to the left 901 feet in length, followed by a tangent of 1,144 feet, a  $2^{\circ}$  curve to the right 1,406 feet in length, 753 feet of tangent, a  $3^{\circ}$  curve to the left 997 feet in length, 460 feet of tangent, a  $3^{\circ}$  curve to the right 690 feet in length, 1,199 feet of tangent, and a  $3^{\circ}$  curve to the left 951 feet in length. The accident occurred on the last-mentioned curve approximately 650 feet from its western end. The grade is 0.64 per cent descending for a distance of about 9,500 feet, followed by level track for about 100 feet, and then the grade is 0.62 per cent ascending for about 1,400 feet to the point of accident.

The track in this vicinity is laid with 90-lb rails, rolled and laid in 1917, with 18 or 19 treated ties to the rail-length, about one-third of the ties being oak and the others pine, tie plates are used and on curves the rails are double-spiked on the gauge side and single-spiked on the outside. The ballast is of slag from 8 to 12 inches in depth.

The weather was clear at the time of the accident which occurred at 8.20 p.m.

#### Description

The train involved in this accident was the first section of eastbound passenger train No. 94, known as the Dixie Flyer, it consisted of engine 1691, one baggage car, three Pullman sleeping cars, one dining car, six Pullman sleeping cars and one observation car, in the order named, all cars being of steel construction. This train was in charge of Engineman Gregory and Conductor Mabry, it left Atlanta at 6.57 p.m., seven minutes late, made a scheduled stop at Griffin, approximately 42 miles from Atlanta, and departed from that point at 8.09 p.m., 12 minutes late; at Irving, the end of double track and 3.8 miles west of Orenard Mill, speed was reduced to approximately 15 miles per hour, the train passing that point, according to the train sheet, at 8.15 p.m., 12 minutes late. The speed of the train at the time of derailment was estimated at about 50 miles per hour.

The engine and the first seven cars in the train were derailed. The engine, tender and second car were turned over on their sides and the dining car was partly overturned, the other cars remaining upright. The engine and tender remained coupled and stopped on a siding to the right of the main track; the first five cars were also derailed to the right or toward the outside of the curve and came to rest at various angles with the main track, the sixth and seventh cars stopped in positions parallel with the main track. The distance from the front end of the engine to the rear of the last car which was derailed was 500 feet, and the track was torn up for that distance.

#### Summary of evidence

On account of injuries sustained in this accident, the enginemen and firemen could not be interviewed at the time of this investigation. Other members of the train crew stated that prior to the accident nothing unusual occurred on this trip; the train was operated at customary speed, the brakes operated properly when the regular stop was made at Griffin, and they had no intimation of danger until the derailment occurred. The flagman and brakeman were in the observation car, and both stated that there was no application of the brakes just before the accident occurred. Conductor Mabry was in the second car from the engine when the derailment occurred, he was engaged in sorting his tickets but did not notice any rocking of the car that would indicate unusual speed, and he thought

that had the train been running at excessive speed his attention would have been attracted by the motion of the cars on the curves in this vicinity. He first realized that something was wrong just as the car in which he was riding was derailed, it appeared to go on for a distance of about two car-lengths, stopped a second or so, and then settled over on its side. He looked at his watch as soon as possible after the car stopped, and it was then 8.20.45 p.m. The flagman and brakeman said the accident occurred at 8.20.p.m.

Operator Shearling, who was on duty at Irving, stated that he delivered clearance cards to the crew as train first No. 94 passed his station, the speed of the train at that time being 12 or 15 miles per hour, after the train had passed over the switch at the end of double track he closed the switch, stepped into his office, which was only 3 or 4 feet from the switch stand, sat down at his desk, noted that it was 8.15 p.m., and reported the train to dispatcher. He heard the noise caused by the derailment, looked at his watch, and it was then 8.20 p.m.

Dispatcher Thompson stated that entries on the sheet are made as soon as "OS" reports are received, prior to the accident he had checked the speed of this train according to the train-sheet record of its movement and found it to be not in excess of the prescribed rate of 55 miles per hour.

Master Mechanic Flowers stated that he made a careful inspection of the engine both at the scene of the accident before it had been picked up and also later at Macon and he was unable to find anything defective which in his opinion could in any way have caused or contributed to the derailment.

Track Supervisor Baggett stated that he arrived at the scene of the accident at 8.50 p.m., made an inspection of the track and found that at the point of derailment a rail on the outside of the curve was partly turned over, the joint at the western end of this rail was not broken but the eastern end was turned down on the ties, the flange was broken and the spikes had been pushed or rolled back. Most of the tie-plates under this rail were still in place and the spikes had not been pulled. The rails in this vicinity had been in service for about eight years and were somewhat curveworn. There was one bad tie under the overturned rail but otherwise the ties were in fairly good condition. After the accident

he made an inspection of the track west of the point of accident, the elevation varied from  $3\frac{1}{2}$  to  $3\frac{1}{2}$  inches and the gauge varied from standard to 4 feet 9 inches. The tie plates did not appear to have cut deeply into the ties and there were only a few spikes that were not fully down at the base of the rail. He made an examination of the derailed engine as it lay after the derailment and also after it was picked up, but did not find anything about it that in his opinion caused or contributed to the accident.

Section Foreman Waldrop stated that during the afternoon of September 26 he was over the track at the point where the accident occurred and noticed nothing wrong with the track at that time. He stated he arrived at the scene of the accident at about 9.30 p.m., and at that time the east end of the outside rail at the point of derailment was turned over and a Pullman car was standing on it, tie plates and spikes on the outside of the rail remained in place and the spikes on the inside of the rail were partly pulled out, indicating that the rail had been pulled up on the inside and pulled out of the spikes. About 45 feet back of the point of derailment the spikes had been partly pulled out; there were 8 or 10 of these spikes and his examination convinced him that they were freshly pulled. He left them in that condition until inspections had been completed and measurements of the track taken. He further stated that he had experienced no special difficulty in maintaining track at this point.

Inspection of the track by the Commission's inspectors disclosed that the angle bars at the receiving end of the overturned rail were intact and all tie plates except two at the leaving end of the rail remained in place, the spikes on the inside of this rail were pulled upward and the inside spikes on the leaving end of the adjacent rail to the west were pulled up on the first 6 ties, on the next 17 ties the spikes on both sides of the outside rail were in place and on the next 10 ties the spikes on the inside of this rail were pulled upward about 1 inch. The first wheel marks on the ties were on the inside of the low rail  $4\frac{3}{4}$  inches from the base of the rail and 15 feet 4 inches from the receiving end of the overturned rail, on the opposite end of the same tie there was a mark about  $4\frac{1}{2}$  inches from the outer edge of the base of the rail which was evidently caused by the head of the rail as it was overturned. A portion of the base of the rail on the gauge side 15 inches long was broken out at a point 16 feet 11 inches from the receiving end. The first wheel marks on

this rail were 42 inches from the receiving end and were on the inside of the head, these marks continued from this point gradually down on the web which at the leaving end showed numerous wheel marks, while the angle bar at the leaving end of the rail was considerably battered. Beyond the leaving end of the overturned rail the track was torn up for a distance of about 500 feet.

Inspection of the track in the vicinity of the point of accident disclosed that the ties were in fair condition, the rails somewhat curve-worn and the joints battered. A number of tie plates were loose under the rail. The alignment of the track was checked in company with the track supervisor and road-master, measurements being taken 33 feet apart from the point of accident westward to the point of the curve, and variations of from  $1/8$  to  $1\frac{1}{2}$  inches were found.

The Commission's inspectors also examined the engine involved and found no condition which in their opinion contributed to the cause of the accident.

The train sheet record and the statements of various employees establish the facts that this train passed Irving at 8:15 p. m. and the accident occurred at 8:20 p. m. The train, therefore, traveled the distance from Irving to Orchard Hill, 3.8 miles, in 5 minutes. The speed of the train at Irving was estimated at 12 or 15 miles per hour and at the time of the accident at about 50 miles per hour. The average speed according to this record was about 45 miles per hour.

#### Conclusions

This accident was caused by the overturning of a rail on the outside of a curve, due primarily to irregularities in alignment and speed which was excessive for the existing elevation.

It is believed the engine was derailed first, and examination of the track clearly showed that the track structure failed due to outward thrust of the wheels. The engine was of the 4-8-2 or mountain type, the total weight of engine and tender being 494,500 lbs. Because of the speed at which this train was being operated, irregularities in alignment, which varied as much as  $1\frac{1}{2}$  inches in a distance of 33 feet, and maximum elevation of  $3\frac{1}{2}$  inches near the point of derailment, the outside rail on this curve was subjected to a thrust which resulted in the partial turning of the rail and in partly

pulling the inside spikes at points from 45 to 60 feet west of the point of derailment, and completely overturning the rail at the initial point of derailment.

The maximum speed limit for passenger trains on this line was 55 miles per hour, and there was no further speed restriction on the curve where the accident occurred. The evidence indicates an average rate of speed from Irving to the point of accident not in excess of the maximum limit, the conductor estimated the speed at about 50 miles per hour but it appears that this estimate was based upon the fact that there had not been any unusual motion of the car in which he was riding that would attract his attention to the rate of speed. At Irving the speed was low, 12 or 15 miles per hour, and the speed of the train was increased after leaving that point. East of Irving there is a slightly ascending grade for about half a mile and then the grade is generally descending nearly to the point of accident. Conditions were therefore favorable for attaining maximum speed with this heavy train by the time it reached the point where the derailment occurred. Whether or not the prescribed speed limit was exceeded can not be definitely determined from the evidence available, but from the conductor's estimate of speed and the distance the engine and cars traveled after being derailed it is believed the rate of speed at least closely approximated the prescribed limit of 55 miles per hour.

The elevation of the outer rail on this 3° curve was at no point more than 3½ inches. Under the recommendations of the American Railway Engineering Association, this elevation was adequate for a speed only slightly in excess of 40 miles per hour, while for a speed of 55 miles per hour an elevation of 6 inches is recommended. It is believed that the speed at which this train was operated, and the maximum speed permitted for passenger trains on this line, did not provide an adequate margin of safety, and that this margin of safety was entirely destroyed by failure to maintain proper alignment and intended elevation.

To provide a proper margin of safety, additional speed restrictions on curves should be prescribed.

All of the employees involved in this accident were experienced men, and none of them were on duty contrary to the provisions of the hours of service law.

Respectfully submitted.

W. P. Borland,  
Director.