

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE LINE OF THE NASHVILLE, CHATTANOOGA & ST.
LOUIS RAILWAY NEAR BARTOW, GA., ON APRIL 17, 1933.

June 12, 1933.

To the Commission:

On April 17, 1933, there was a derailment of a Louisville & Nashville passenger train on the track of the Nashville, Chattanooga & St. Louis Railway near Bartow, Ga., which resulted in the death of 2 employees and 2 trespassers, and the injury of 6 passengers, and 5 dining-car employees. This investigation was made in conjunction with a representative of the Georgia Public Service Commission.

Location and method of operation

This accident occurred on that part of the Atlanta Division which extends between Atlanta and Junta, Ga., a distance of 47.81 miles, and is a single-track line over which trains are operated by time table, train orders, and an automatic block-signal system. This track is used jointly by the Louisville & Nashville Railroad and the Nashville, Chattanooga & St. Louis Railway, and the latter road has charge of the operation. The accident occurred at a point 2,923.4 feet south of the south switch of a passing track at Bartow, approaching this point from the south, there is a 4° 12' curve to the left 860 feet in length, tangent track for a distance of 80 feet, and then a 5° 32' curve to the right 2,423 feet in length, the accident occurred on this latter curve at a point 1,623 feet from its southern end. The grade is generally descending for north-bound trains and is 0.48 per cent at the point of accident.

The track is laid with 110-pound rails, 39 feet in length, with 20 or 21 treated ties to the rail length, tieplated and double-spiked on the outside of the curves. The track is ballasted with slag and gauge rods are in use. The speed for passenger trains is restricted to 45 miles per hour.

The weather was clear at the time of the accident, which occurred about 8:03 p.m.

Description

North-bound Louisville & Nashville passenger train no. 18 consisted of 1 storage mail and express car, 1 express car, 1 combination baggage car and coach, 1 coach, 5 Pullman sleeping cars, 1 dining car, and 1 observation car, all of steel construction, hauled by engine 421, and was in charge of Conductor Butcher and Engineman Evans. This train departed from Atlanta at 6.50 p.m., according to the train sheet, 35 minutes late, and at Bolton, 6.58 miles from Atlanta, the crew received a

copy of a train order directing them to run 30 minutes late. The train passed Acworth, 7.18 miles south of the point of accident, at 7 52 p.m., 38 minutes late, and on approaching Bartow was derailed while traveling at a speed estimated to have been about 40 miles per hour.

The engine, tender, first five cars and the front truck of the sixth car were derailed. The engine, tender and first two cars stopped on the side of a cut, on their left sides to the left of the track, the pilot was 14 feet from the track and the rear end of the engine was 6 feet from the center of the track. The tender remained coupled to the engine. The distance between the track and the first two cars varied from 8 to 30 feet. The third car was diagonally across the track leaning toward the left, and the fourth and fifth cars remained upright in line with the track. The employees killed were the engineman and fireman.

Summary of evidence

Conductor Butcher stated that he was riding in the third car of the train and noticed nothing unusual until the brakes were applied in emergency, followed by the derailment. He had not paid particular attention to the speed, but thought the highest speed attained was about 40 miles per hour and that the train was traveling at that speed at the time of the accident, and he said he did not notice any application of the brakes on the long descending grade approaching the point of accident. Conductor Butcher further stated that a terminal test of the air brakes was made at Atlanta and the brakes were reported to be working properly and while en route he had looked out along the train but had noticed nothing wrong, neither did there appear to be anything wrong with the track or with the riding of the cars.

Flagman Rodgers, who was in the observation car, noticed no unusual speed and looked out at several points en route to inspect the train, the first he knew of anything wrong was when he was thrown from his seat against the front of the car, it was his opinion that this was due to the impact and not to an application of the brakes, as there was considerable rebound to the car which made him think that the train had struck something. He went back immediately to flag but did not see any marks or anything about the track that might have contributed to the accident.

Section Foreman Mitchell, in charge of the section on which this accident occurred, stated that the last work performed in the vicinity of the point of accident was on March 30, when he did some leveling, lining, and tamping of a few low joints, and he last patrolled the track on April 15, going over it on foot. The line and surface were good, ties in good condition, and the ballast was up to the tops of the ties, the superelevation, which was $5\frac{1}{2}$ inches, was uniform. The rails were worn off about $1\frac{1}{2}$ inch, but had not reached the condemning limit and were in fairly good condition, all of them measuring above 2 inches. While there were a few angle bars on this curve that

indicated that wheel flanges had touched them, Section Foreman Mitchell did not think that the flanges had ridden them hard enough to wear the bars, but rather that the slivers of metal found on the angle bars came from the ball of the rail. He said he had pulled the slivers off the rails and angle bars on several occasions but had not examined them closely, supposing that they came from the rails. Section Foreman Mitchell further stated that he kept a tight gauge on the curves in his section, and if the gauge became $\frac{1}{2}$ inch open he would give it attention.

Track Supervisor Oliphant stated that the rails and angle bars were worn on this curve and that the same condition existed on other curves, but no trouble had ever been experienced as a result of that condition. The horizontal wear on the rails was about $\frac{5}{8}$ inch, none of them being worn down below 2 inches. They were laid in the spring of 1926 and new rails were lying along the track preparatory to being laid. The rails on the high side of the curve are well oiled. Supervisor Oliphant stated that the last time he rode an engine over that section of track before the occurrence of the accident was about the first of April, at which time the engine rode smoothly. After the accident he found four or five broken rails in the wreckage, but as a result of his examination he was unable to say what caused the accident.

Division Engineer Anderson, of the NC&STL, stated that none of the rails was worn down close to the limit, all of them measuring well over 2 inches, and that while they were to have been taken out, this was because they were to be used in patching the track on other curves, otherwise they would have been left in place for another year. He did not consider a rail to be unsafe until it was worn below $1 \frac{5}{8}$ inches, nor did he consider it unsafe when the gauge side of the outer rail on a curve was worn to such an extent that it conformed to the shape of a wheel flange, and he said that in his opinion a wheel with a vertical flange worn $1 \frac{3}{8}$ inches in depth would pass safely around such a curve at a train speed of 40 miles per hour even if the flange were touching the angle bars, in fact, they have many other curves where flanges touch the angle bars and no trouble has developed. He was unable to state what the distance would be between the top of the angle bar on the gauge side of the rail and the top of the rail, but Chief Engineer Blackie stated that on the new rails the distance was about $1 \frac{1}{4}$ inches.

In a report from the division engineer to the superintendent, dated April 21, it was stated that the first marks on the track were at a point about 490 feet south of the front end of the engine, consisting of a flange mark on a tie near the east or low rail and a flange mark on the web of the high rail, this latter mark extending northward about 50 feet and apparently having been made by the front truck of the sixth car, which was standing at that point when the train stopped. The next mark on the web of the rail commenced $7 \frac{1}{2}$ feet beyond and extended northward 43 feet. From this point northward for a distance of 100 feet there were numerous flange marks in the web of the

rails and on the ties up to the point where the track was demolished. North of the demolished track, the ties were marked for a distance of 49 feet, these marks gradually becoming less pronounced, and then for a distance of 171 feet to a point opposite where the head end of the engine stopped there were no marks of derailment. Beginning with the high rail where the first flange mark appeared on the web, the first two rails were turned over but still connected, with the north end of the second rail off the ties. The next six rails were scattered at various points and after the wreckage was cleared they were assembled and it was found that four of these rails had been broken and the others badly bent, a triangular piece near the leaving end of the fourth rail could not be found. All the breaks were clean cut and sharp at the ball of the rail and there were no indications that a wheel had run over the ball of the rail after the breaks occurred. No marks were found on the ball of the rail which could be identified as flange marks. Measurements of the track taken south of the point of accident showed that the elevation varied from 5 3/8 inches to 5 9/16 inches and the gauge from 4 feet 8 1/2 inches to 4 feet 8 7/8 inches.

Division Engineer Lockhart, of the L&N, stated that two of the breaks in the rails could have occurred under the engine, as the leaving end of the rails at the break was undeformed and the receiving end of the adjoining section was deformed, the fourth rail, from which a piece was missing, showed the leaving end of the broken section undefaced and the receiving end badly battered, indicating that something had struck it a terrific blow on the right upper corner, which could have been done by a driving wheel, but there were no marks indicating that a flange had passed over the rail, he found no fissures in any of the breaks. Division Engineer Lockhart found the track south of the point of derailment to be in good gauge, elevation and surface.

General Car Foreman Carman, of the NC&STL, who arrived at the scene with the wreck train, stated that he made an inspection of the equipment soon after the accident and again after it was picked up but could find nothing that could have contributed to the cause of the accident.

Master Mechanic Oakley, of the L&N, stated that he made a very careful examination of the engine and found all flanges practically in perfect condition with the exception of the left lead wheel on the rear tender truck, which was worn to some extent but had not reached the condemning limit. The lateral in both engine trucks did not exceed 5/16 inch and on no driving wheel did the lateral exceed 3/16 inch. All spring rigging, spring saddles and driving springs on the engine were in good condition and there was no indication of any part of the engine having been binding. It was his opinion that the accident was due to a broken rail.

Engine Inspector and Machinist Garwood, of the L&N, stated that he inspected engine 421 at the Atlanta Terminal before its departure on the day of the accident and found the shoes and

wedges, tires, engine and trailer trucks and brake rigging in good condition.

Car Inspectors A. E. Almand and C. W. Almand, of the NC&STL, inspected train no 18 before its departure from Atlanta, both as to running gear and air brakes, and found it in good condition.

A careful examination of the engine and cars made by the Commission's inspectors failed to disclose any defects that could have contributed to the cause of the accident, there was slight wear on the left front wheel of the rear tender truck, but it was not sufficient to be condemnable. The track was so badly torn up that it was impossible to determine the initial point of derailment, and although several of the rails were broken there were no indications of fissures and no positive evidence that those breaks had occurred prior to the derailment. There was considerable flange wear, however, on the gauge side of the outer rail on the curve, the heads of the rails being worn to such an extent that the wheel flanges were riding on top of the angle bars, which also were considerably worn, the metal ground off the tops of the angle bars being rolled out along the top against the ball of the rail so that the rail conformed to the shape of a wheel-flange, materially increasing the traction against the high rail.

The train sheet record showed train no. 18 as passing Elizabeth at 7:37 p.m. and Acworth at 7 52 p.m. The distance between these points is 12.81 miles, and the 15 minutes consumed indicates that the average speed was about 51 miles per hour. The distance from Acworth to the point of accident is about 8 miles and with the train traveling this distance in 11 minutes it shows an average speed of nearly 44 miles per hour. The average speed for the 21 miles from Elizabeth to the point of accident was about 48 miles per hour.

Conclusions

This accident is believed to have been caused by failure of the track under the train.

Examination of the train equipment failed to disclose any condition which might have contributed to this accident except a worn flange on one of the tender wheels. Examination of the track showed that the rails were curve-worn, with the flanges of the wheels coming in contact with the angle bars, and there were also four rails on the high side of the curve which were broken, none of which, however, showed any defects. The gauge and elevation of the track south of the wreckage were well maintained, and there was nothing to indicate that excessive speed was the cause, and in view of the way the track was torn up or buckled under the train, making it difficult to ascertain the initial point of derailment, it was impossible to determine the exact cause of the accident.

Respectfully submitted,
W.P. BORLAND,
Director.