INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE YAZOO & MISSISSIPPI VALLEY RAILROAD AT MEMPHIS, TENN , ON JANUARY 4, 1925.

February 6, 1925.

To the Commission:

On January 4, 1925, there was a derailment of some cars being handled by a switch engine on the Yazoo & Mississippi Valley Railroad at Memphis, Tenn , resulting in the death of one employee.

Location and method of operation

This accident occurred on the Memphis Terminal Division, within yard limits, on what is known as the McLean Hardwood Lumber Company's spur track, which leads off the river main switching lead to the north, the switching lead extends westward to the Mississippi River, a distance of about 1 mile Movements in this territory are governed entirely by yard rules. Beginning at the switch leading to the McLean Hardwood Lumber Company's spur, and proceeding eastward on the spur, there is a 13° curve to the left 720 feet in length, following which the spur track is tangent to its end, a distance of 598 feet; the derailment occurred on the above-mentioned curve at a point 2 feet from its leaving end The grade on the spur is ascending for eastbound movements, varying from 1.7 to 1.9 per cent, being at its minimum at the point of accident. Mallory Avenue crosses the spur at a right angle, just before reaching the point of derailment, while there is a coal shed, 40 feet in length, on the right side of the spur just beyond Mallory Avenue, 14 6 feet beyond the point of derailment, the distance between this coal shed and the center line of the track is only 7 feet 2 inches Another industrial track, known as the St Louis Fire Works Company's spur, leads off the lumber company's spur to the left from a point near the center of the curve on which the accident occurred The spur track is laid with rails varying in weight from 56 to 85 pounds per yard, there are from 16 to 18 ties to the rail-length, tie-plated, and the track is maintained in generally good condition considering the service for which it is used.

The weather was clear at the time of the accident, which occurred at about 4.15 a.m

Description

Switch engine 246, headed east, in charge of Foreman Driver and Engineman Palmer, placed several empty flat cars on the spur just beyond Mallory Avenue, the engine then went in on the fire works company's track, after which the empty cars were dropped down the grade past this switch and set out Engine 246 then pushed 12 flat cars loaded with logs in on the lumber company's track and just after passing Mallory Avenue the first three cars were derailed to the right on account of a broken rail, while traveling at a speed estimated to have been between 10 and 12 miles an hour, the head end of the first car striking the side of the coal shed.

The derailed cars remained upright and sustained no damage of any consequence. The employee killed was the foreman, who was riding on the right forward sill-step of the leading car and was crushed between the car and the coal shed.

Summary of evidence

Members of the crew stated that the engine had crossed Mallory Avenue and passed over the point of derailment at the time the empty flat cars were placed on the lumber company's track. Shortly afterwards the loaded cars were shoved in on this track at a speed of 10 or 12 miles an hour Switchman Sims was riding on the leading car at the time of the accident and was unaware of anything wrong until the car struck the coal shed. He stated that on several occasions prior to the accident he had cautioned Foreman Driver about passing the coal shed in the position he occupied at the time of the accident, and that he had again cautioned him on this particular occasion, but that the foreman said he could see signals better from that position.

Immediately after the accident a broken rail was found on the outside of the curve just north of Mallory Avenue, the break was square and occurred at a point 26 inches from the leaving end of a 56-pound rail, 30 feet in length, directly over the center of a sound and well-supported tie. The rail involved was a P R.S.* rail, rolled in 1883; it was laid in the lumber company's track in 1905, after having been in service elsewhere. On account of the rail being badly pitted by rust the heat number could not be deciphered It was considerably gauge worn, although at the point of derailment the gauge of the track was normal, being 4 feet 9 inches, the superelevation was 1½ inches A distinct flange mark appeared on the fractured end of the short section of the broken rail, it then appeared on the head of the

next rail and continued for a distance of 8 feet 11¼ inches to the point where it dropped to the tie on the outside of the rail

The fractured ends of the broken rail showed the origin of rupture to have been at the edge of the outer flange of the base, thence extending across the full cross section of the rail with a square granular break. There was no display of toughness or ductility in the metal of the rail, it was a brittle fracture.

Examination of the fractured ends showed a local injury at the edge of the flange, at which point the fracture had its origin. Apparently a chisel mark at some earlier period in the life of the rail had been made on the upper side of the flange at its outer edge. This injury finally led to the fracture of the rail.

Brittleness of rupture under such a condition is expected The injury was one of long standing, but nevertheless was a constant menace to the integrity of the rail and although it may have been in existence a term of years such an injury is likely to cause rupture at any time.

There was a group of marks of the same character on the upper surface of the outer flange 2 inches from the plane of rupture, also at a distance of 17 inches, toward the middle of the length of the rail, another group was found. The flanges of the base and the sides of the web were deeply corroded by rust, not obscuring these marks of injury however

Conclusions

This accident was caused by a broken rail.

This rail failed apparently from a preventable cause, that is, the local injuries were the result of abuse which doubtless occurred while the rail was in the track. Any incision in the metal of the rail, particularly in the fibres remote from the neutral axis of the cross section, constitutes an injury directly tending toward ultimate rupture. In the present rail the time of fracture was long deferred, judging from the general condition of the rail. Under more severe conditions of service earlier fracture would be expected.

In relaying rails from main-line tracks to yard and industrial tracks care should be exercised in the prevention of local injuries.

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