

July 2, 1915.

In re: Investigation of accident which occurred upon the line of the Southern Pacific Company near Tonopah Junction, Nev., June 15, 1915.

On June 15, 1915, there was a derailment of a mixed train on the line of the Southern Pacific Company near Tonopah Junction, Nev., which resulted in the death of 2 employees and the injury of 1 employee. After investigation of this accident the Chief of the Division of Safety reports as follows:

The train involved in this accident was west-bound mixed train No. 191, consisting of an empty box car, 5 box cars loaded with ore, 1 car of merchandise, 3 empty flat cars, 1 combination baggage and express car, and 1 coach, hauled by locomotives 6 and 14, and was in charge of Conductor Davidson and Engineers Ward and Hoyt. The train left Belleville, Nev., at 7.30 p.m., and at 7.53 p.m. was derailed at a point 4.4 miles west of Belleville, while running at a speed estimated to have been about 10 miles per hour.

The second locomotive and the first two cars were derailed and turned over on their sides. The employees killed were the fireman of the second locomotive and the head brakeman.

This part of the Salt Lake Division of the Southern Pacific Company is single track, narrow gauge line. No block

signal system is in use, trains being operated by train orders and time-card rights. The accident occurred about 150 feet west of the eastern end of a curve of 13 degrees to the left, on a descending grade for westbound trains of about $2\frac{1}{2}$ per cent. The track is laid with 35-pound rails, 30 feet in length, with an average of 14 ties under each rail, rail braces being used on the curve on which the accident occurred. This is a branch line and has a dirt road bed, with no ballast. While not in the best of condition, it is believed to be safe for the speed at which trains are allowed to run on this grade, which is 15 miles per hour.

The only wheel marks on the ties were made by the first part of the train to be derailed, which was the second car in the train. This car ran on the road bed a total distance of 113 feet before going down the six-foot embankment and turning over. When it turned over the coupling held between it and the first car, an empty box car, so that the latter car also tipped over, together with the locomotive immediately ahead. The coupling broke between the two locomotives, the leading one remaining on the rails.

Examination of the equipment showed that the bottom brake rod had broken on the rear end of the second car. This brake rod, which was made of five-eighths-inch iron, broke near the rear brake beam, leaving about 4 feet 8 inches of it trailing. This loose end of the rod swung across the outside rail and was caught by the tread of the rear

wheel of the rear truck. This placed an unusual strain on the wooden brake beam on the forward end of the truck, causing it to break in two nearly in the center and allowing the rod to trail back far enough to catch under and derail the rear pair of wheels. The rod also had marks on it indicating that it had dragged under the wheel. The examination of the fractured surfaces of the broken brake rod showed slight evidences of defect, which could not, however, have been detected by car inspectors when making inspections of the equipment.

Engineman Gard of the leading locomotive stated that he had made a five or six pound application of the air brakes while on the tangent immediately east of the curve and had just released the brakes when he felt a jerk and on looking back he saw the second car tipping over, dragging with it the first car and the second locomotive. The derailment of the cars broke the train line, the air brakes being applied automatically, bringing the train to a stop in a short distance.

Assistant Superintendent Moore, who was a passenger on the derailed train, stated that the speed of the train was slow and that when it stopped he thought the engineman had brought the train to a stop on account of cattle or some other obstruction on the track. He looked over the trucks, wheels, etc., of the derailed locomotive and cars, and discovered the broken brake rod attached at one end to a portion of the brake beam which had been torn from the brake

hanger. Mr. Moore stated that when he found the brake rod and the portion of the brake beam, the brake rod was lying on the track between the rails while the portion of the brake beam was on the fill just outside of the ties. This portion of the brake beam had been torn from the hanger on the left side of the car. Mr. Moore stated that he also walked back at least 1 mile to see if any of the equipment had dropped off on the track, and found nothing. With a track level and gauge he took measurements of the track every fifteen feet for a distance of 130 feet east of the initial marks on the ties. At no point was the gauge over five-eighths inch wide. At a point where the measurements were begun, 180 feet east of the initial marks on the ties, the superelevation was five-eighths of an inch; this was just east of the point of curve. This superelevation increased to four inches at a point 30 feet east of the initial marks on the ties. At the point of derailment the gauge was five-eighths inch wide, while the superelevation was 3 inches. Mr. Moore further stated that the initial flange marks were on the inside of the right hand rail, 4 inches from the gauge side of the same. He examined the left hand rail but found no mark on it made by the wheels, the wheels on that side apparently having been thrown entirely across the rail without touching it. When the 5 cars of ore were picked up at Belleville, he inspected 2 of the cars and found the loading to be evenly distributed with respect to the

sides of the cars. Neither of these cars, however, was the one which afterwards derailed.

Conductor Davidson stated that when the cars were picked up at Belleville, he looked inside to see how they were loaded. He found that the ore had been shoveled to the ends of the cars, tapering down as it neared the middle of the cars, where there was practically no ore. At the deepest point there was about three feet of ore.

Assistant Master Mechanic Jones, who had had about 18 years' experience, stated that when he examined the broken brake rod, he found that there were two welds in it; the rod did not, however, break at either of these welds. The break was a straight break and the iron appeared to be in very good condition except that it showed slight flaws and some evidence of crystallization. It did not, however, show that it had been overheated when the welding had been done.

This accident was caused by the derailment of the rear truck of the second car in the train, due to the breaking of the bottom brake rod on that car, which in turn, being caught by a wheel, resulted in the breaking of the brake beam, which allowed the bottom rod to trail back far enough to derail the rear wheels of the car. What caused the breaking of the brake rod at this particular time was not determined.