

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE
MINNEAPOLIS & ST. LOUIS RAILROAD NEAR LIVERMORE,
IOWA, ON AUGUST 29, 1917.

September 28, 1917.

On August 29, 1917, there was a derailment of a passenger train on the Minneapolis & St. Louis Railroad near Livermore, Iowa, which resulted in the death of 2 passengers and injury to 13 passengers and 2 employees. The investigation of this accident was participated in by the Iowa State Railroad Commission; after investigation, the Chief of the Division of Safety reports as follows:

The Minneapolis & St. Louis railroad is a single-track line, over which train movements are governed by time-table and train orders, no block signal system being in use. The speed of passenger trains over the district on which this accident occurred, is restricted by time-table to 40 miles an hour. The accident occurred at Mile Post 192 which is 950 feet east of Bridge 129 and 600 feet west of Bridge 130. Approaching the point of accident from the west, the track is straight for 2,550 feet, while beginning at a point 300 feet west of the point of accident and extending eastward to Livermore station, a distance of about one-half mile, the grade is 1 per cent ascending. The weather at the time of the accident was clear.

The track in this vicinity is laid with 70-pound rails, 33 feet in length, single spiked to about 18 cedar ties under each rail, the rails being laid with even joints. The track at the point of accident is laid on a fill, which at the point where the train involved came to a stop, is 20 feet in height; the ballast consists of a thin mixture of gravel and cinders, practically all of which has been washed away, leaving the track without a proper shoulder to protect it.

The train involved was eastbound passenger train No. 2, consisting of 1 mail car, 2 baggage cars and 3 coaches, all of wooden construction, hauled by locomotive 215, and was in charge of Conductor Pooney and Engineman Galloway. This train, en route from St. Paul, Minn., to Des Moines, Iowa, left Luverne, Iowa, the first station west of the point of accident, at 2:59 p. m., 10 minutes late, and at about 3:15 p. m., was derailed at a point about one-half mile east of Livermore station, while traveling at a speed estimated to have been about 35 miles an hour.

After derailling, the train ran a distance of 600 feet to Bridge 130, and after it came to a stop all of the train, with the exception of the locomotive and mail car, tipped

over to the right. The engine was not derailed, but the forward truck of the tender derailed and lined up with the track while its rear truck remained on the right-hand rail and inside the left-hand rail. The mail car was derailed but remained upright on Bridge 130. The first baggage car turned over to the right, falling from Bridge 130, the superstructure being completely demolished. The remaining cars, with the exception of the rear coach which was partly turned over, came to rest at the bottom of the fill. With the exception of the head baggage car, none of the equipment sustained serious damage.

An examination of the track showed the first marks of derailment to be at Mile Post 192. The south rail at that point showed the marks of the tender-truck wheel for a distance of about 14 feet along the top of the rail. The track was badly torn up and it was necessary to renew all of the ties between Mile Post 192 and Bridge 130, a distance of 600 feet. Owing to this fact it was impossible to obtain any measurements or data covering the condition of the track at the immediate point of accident.

An inspection of the track between Bridge 129 and the point of renewal disclosed the surface to be irregular, the north rail in one or two places being as much as 1-1/8 inches low while the south rail was found in places to be 1/4 inch low. The gauge varied from one-half inch narrow to five-eighths inch wide; where the track was narrow the rails and spikes plainly showed the lateral movement of the same on the ties, and the track could be made standard by kicking the gauge into place. The first eight rail sections showed 10, 20, 16, 14, 18, 25, 13, and 27 spikes, respectively, which were either missing or could be pulled from the track by hand. A number of rail joints were found in which all of the spikes on both sides of the joint were either missing or could be removed by hand. The rails were found to have crept toward the east to such an extent that many of the rail joints had only one tie supporting them. A considerable portion of the ties were decayed and some were broken; a large part of them were rail cut and in one rail section as many as six consecutive ties were cut to a depth of from 3 to 4 inches. In numerous places the spikes were several inches above the base of the rail, due to the rail-cut condition of the ties and fully 50 percent of the spikes in the rails were of no service whatever.

Inspection of the tender developed that it was in excellent condition, with the exception of a broken brake beam and bent brake lever which was the result of the derailment. The wheels were in good condition and in proper gauge, the coupler bar and connections showed no evidence of binding at any point and there was nothing irregular in the design or construction of the tank.

The tender is 17 feet in length with a wheel base of 15 feet and 15 inches and has a capacity for 5,000 gallons of water and 11 tons of coal. It is equipped with parallel and cross-sectional splash plates, which were all in good condition. The distance between the track and the deck of the tender is 52 inches and there are 53 inches from the top of the deck to the top of the cistern, with an 18-inch flange above the cistern.

Conductor Keeney, of train No. 2, stated that at the time of the accident he was riding in the smoking car, the fourth car from the locomotive, and he estimated the speed at the time to be 35 miles an hour; he did not consider this speed unusual. He noticed nothing unusual with the operation of the train until he felt the car in which he was riding leave the rails.

Brakeman Foyeland stated that after the derailment he went back a distance of a quarter of a mile to flag and made a rough inspection of the track as he went. While he found the track to be spread east of the point where the tender first mounted the rail, he stated that he found nothing west of the point of accident which might have contributed to its cause.

Enginemen Galloway stated that the train had been riding smoothly until after passing bridge 120, when the engine began to rock and roll. He made a service application of the brakes, immediately after which he discovered that the tender was derailed and he then made an emergency application of the brakes. He estimated the speed at the time of derailment to have been 35 miles an hour. He stated that after the train had come to a full stop in an upright position he looked back and saw the cars, with the exception of the mail car, turn over down the embankment.

Fireman Sinclair stated that at the time of the derailment the tender was practically filled to capacity with coal and water. He stated that this locomotive rolled more than the type of locomotive^{he} had been accustomed to firing, although they were running at the usual rate of speed. He also stated that after the train came to a stop and while he was out on the steam chest prepared to jump, he heard a crash and looking back, saw the cars turn over down the fill.

Section Foreman Peterson stated that he arrived at the scene of the accident about 2 hours after its occurrence and found the track from bridge 130 west for a distance of 150 or 400 feet to be badly torn up, the rails being spread apart and the ties broken. He stated that

he did not consider the track good between Bridge 129 and the point where the first mark appeared on the south rail. He took charge of this section, which consists of 6 miles of track, on May 24, 1917, and during the months of July and August has had 2 sectionmen working with him.

Superintendent Howie, who made an inspection of the track after the derailment in company with Track Supervisor Griffin and the Commission's Inspectors, stated that he thought its condition contributed to the cause of the accident.

Track Supervisor Griffin stated that although it had been planned to put in about 35 or 40 new ties between Bridges 129 and 130, this work had not been done on account of the scarcity of labor. He further stated that he rode on a train over this piece of track on the day of the accident previous to its occurrence and last walked over it about 3 weeks previous, but he considered the track good and issued no instructions to the section foreman with regard to repairing it.

The direct cause of this accident was uneven and insecure track conditions. The ballasting was not sufficient to provide a shoulder or crown to properly support the track on the fill. The broken and decayed ties, loose and missing spikes, loose rail joints, irregular gauge and surface of rail, low joints, etc., all contributed to an exceedingly dangerous condition of track, over which to permit trains to run at a speed of 40 miles per hour. This condition together with the speed at which the train was running caused the wheels of the front tender truck to climb the rail on the south side of the track, after which they dropped onto the ties, followed by the wheels of the mail car, causing the track to spread and the subsequent derailment of the entire train.

The tender of the locomotive, which was practically full of coal and water, provided a high center of gravity on account of its short wheel base and was a contributing cause of the derailment because of the failure to maintain the track in proper condition.

The statements of the crew of train No. 2 were to the effect that the train had come to a standstill on the fill before tipping over; this is confirmed by the condition of the derailment and the side of the fill. Had there been a sufficient amount of shoulder to the track on the fill it is probable that the coaches, at least, would have remained upright and the fatalities would have been averted.

The evidence indicated that the train was running at a speed of about 35 miles an hour at the time of the derailment which was within the maximum speed limit of 40 miles an hour permitted by time-table rule. It is absolutely impossible to operate trains with safety over track in such condition as prevailed at this point at a speed of 40 miles an hour, and it is believed that the maximum speed limit on this track, in its present condition, should be materially reduced.

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