

INV. 285
August 25, 1915.

**IN RE INVESTIGATION OF ACCIDENT WHICH OCCURRED ON
THE NORFOLK & WESTERN RAILWAY AT SWORDS
CREEK, VA., ON AUGUST 3, 1915.**

On August 3, 1915, there was a derailment of a freight train on the Norfolk & Western Railway at Swords Creek, Va., which resulted in the death of two employees and the injury of three employees. After investigation of this accident the Chief of the Division of Safety reports as follows:

The train involved in this accident was eastbound freight train 1st No. 86, consisting of 32 cars and a caboose, hauled by locomotives 1069 and 360, and was in charge of Conductor Meade and Enginemen Kelley and Kippe. It left Horton, Va., its western terminal, at 5:15 a. m., on time, and at 9:02 a. m. was derailed about 400 feet east of the station at Swords Creek while traveling at a speed of about 25 miles per hour.

The first engine landed at the bottom of the twenty-foot embankment on the right side of the track nearly 400 feet beyond the initial point of derailment. The second engine passed the first engine, going down the embankment on the same side and coming to rest about 50 feet from the first engine. Nine cars were also derailed.

This part of the Norfolk & Western Railway is a single track line, train movements being protected by the manual block signal system. The track is laid with 65-pound rails, 33 feet in length, with an average of about 19 oak ties under each rail, ballasted with about 8 inches of cinder ballast. Tie plates are used, and at the point of the accident the rails are double-spiked on the outside. Approaching the point of

derailment from the west there is 750 feet of tangent, followed by a curve to the south 500 feet in length, then 150 feet of tangent, followed by a curve to the north 750 feet in length. The derailment occurred on this latter curve, at a point 496 feet east of its western end. This last curve had a maximum curvature of 14 degrees; at the point of derailment it was $11\frac{1}{2}$ degrees. The maximum superelevation on this curve was $3\frac{1}{2}$ inches except at a point one rail length west of the point of derailment, where the superelevation was 4 inches. The gauge varied from $4' 8\frac{1}{2}"$ to $4' 9"$; at the point of derailment it was $4' 8\frac{1}{2}"$. The grade was practically level. The speed of trains on this curve was governed by green "C" boards, which limited the speed of passenger trains to 25 miles per hour and freight trains to 15 miles per hour. The general condition of the track was good throughout. The weather was clear.

Examination of the track showed that the first mark of derailment was a flange mark on the outside rail of the curve at a point 412 feet east of the station. This mark extended diagonally across the rail a distance of four feet before dropping off on the outside. There was then the mark of a single wheel on the tie on the outside of the outer rail. The marks of this pair of wheels continued up to the switch frog at the eastern end of the passing track, a distance of 180 feet, beyond which point the track was completely torn up for a distance of 210 feet.

Engineman Kelley, in charge of locomotive 1089, stated that after leaving the last station he made a fairly

good run until near the curve about one mile from Swords Creek, when he made an application of the air brakes and brought the train to a low speed. He then released the brakes and was working steam a little when passing Swords Creek station at a speed estimated by him to have been about 20 miles per hour. The first indication he had of anything wrong was when he felt the driving wheels drop on the ties. He did not know whether or not he made any application of the air brakes when the accident occurred. He stated that he had intended going to Daw, 5.5 miles beyond Swords Creek, for eastbound passenger train No. 12, and if he had had time enough at that point he would have gone to Richlands, 6 miles beyond Daw. Train No. 12 was due at Swords Creek at 9:19 a. m., Daw at 9:31 a.m., and at Richlands at 9:48 a. m. He had not noticed anything unusual with the riding of the engine, and the track seemed to be in good shape. Engineman Kelley further stated that he was not sure whether or not there were any speed restrictions on this curve, neither was he positive as to whether or not there were any green "C" boards governing the speed of trains while rounding this curve. He had first run an engine on this part of the road about four months previous to the day of the accident, but since that time had made several trips over it.

Fireman Kitts, of the leading engine, stated that the engineman applied the brakes coming down the hill into Swords Creek and then released, and was working steam when near the west passing track switch. He thought the speed was a little higher than usual at the point of derailment, saying that he

thought it was between 25 and 30 miles per hour.

Fireman Hall, of the second engine, stated that the train was traveling at a good rate of speed when derailed, estimating it to have been from 25 to 30 miles per hour. He did not think, however, that the train was traveling at a rate of speed which was faster than customary. The engineman of the second engine was killed in the accident.

The section foreman, who was standing west of the station when the accident occurred, thought the speed was a little higher than usual, saying that it was about 25 miles per hour. The agent at Swords Creek thought it was about 20 miles per hour, while the conductor, who was riding on the rear of the caboose, agreed with the estimate of the agent.

Superintendent Weller stated that he examined the track and found the point where the forward wheels of the engine truck of locomotive 1089 had mounted the rail and dropped off on the outside. He also found a black spot on the ball of the rail about three inches in diameter which looked as if something had been placed on the rail and had been run over by a locomotive or car. He could not find anything which appeared to have been run over and therefore was unable to say that any part of train 1st No. 26 had run over anything, but he thought it significant that it was in the right place to cause the wheels to raise up. When locomotive 1089 was picked up after the accident he made an examination of it but could find nothing about it which might have caused the accident. He stated that from his examination he had not formed any conclusion as to the

cause of the accident.

Master Mechanic Barry stated that when he examined the forward pair of engine truck wheels of locomotive 1089 he found the truck to be in a badly damaged condition, the frame having been bent and the rear pair of wheels torn from the frame. He examined the frame for lateral motion, but on account of its condition found it difficult to determine the amount of lateral which had existed prior to the accident. He measured it, however, and found it to be about one inch in the forward pair of wheels. All flanges and other laterals were found to be in good condition, both on locomotive 1089 and on locomotive 380, with the possible exception of the left back driving wheel of locomotive 380, which would almost take the gauge.

Engine Inspector Gilpin stated that he examined locomotive 1089 the day before the accident. He found the lateral motion in the forward engine truck wheels to be between one-half and three-fourths inch; he did not examine the back engine truck wheels, while the driving wheels had a lateral motion of about one-half inch.

Roadmaster Wilson stated that the standard superelevation on this road on curves of 12 degrees was four inches. He considered the superelevation of $3\frac{1}{2}$ inches at the point of derailment to be sufficient, saying that the speed of passenger trains was very low on account of the curve being so near the station, while the speed of freight trains is low on account of the curve being protected by green "C" boards.

This accident was caused by excessive speed while

rounding a 14-degree curve which was protected by slow boards limiting the speed of freight trains to 15 miles per hour. All the evidence is that this train was exceeding the speed limit at the time of the accident, the very lowest estimate of speed being 20 miles per hour. In view of the engineman's statement that he expected to go to a station 3.5 miles ahead in advance of a passenger train which was due at Swords Creek only 17 minutes after the derailment occurred, it is believed that the speed at the time of derailment was considerably in excess of 20 miles per hour. The estimates of the two firemen and the section foreman, who placed the speed at 25 to 30 miles per hour, are believed to be nearer the truth.

The Superelevation on this curve was at no point sufficient to permit a safe speed in excess of 20 miles per hour, yet passenger trains were permitted to run 25 miles per hour. This speed should either be reduced to the limit of absolute safety, or the superelevation should be increased.