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Dept. of Transportation

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Honorable C. C. McChord,

Commissioner,

U. S. Interstate Commerce Commission.

In re train accident near Martin's Creek Station on the Belvidere Division of the Pennsylvania Railroad.

Dear Sir:

We have the honor to report to the Commission the result of our inquiry, held, jointly with the Board of Public Utility Commissioners for the State of New Jersey, at Trenton, New Jersey, May 31, 1911, into the causes leading to the accident which occurred eight-tenths of a mile south of Martin's Creek Station on the Belvidere Division of the Pennsylvania Railroad, April 29, 1911.

Description.

The second section of passenger train No. 573 consisted of Pennsylvania engine No. 3169, D.L.&W. combination car No. 706, D.L.&W. coaches Nos. 84, 100 and 65, and D.L.&W. dining car No. 458, in the order named. All of the cars were of wooden construction with vestibules and steel platforms. Coach No. 100 was lighted with acetylene gas, and dining car No. 458 was lighted with acetylene gas and equipped with an axle-generator for electric light. The other cars were lighted with Pintsch gas. Train enroute from Utica, New York, to Washington, D. C., with 166 passengers and 2 tourist agents. Train left Manunka Chunk at 2:40 p. m. and was derailed at about 2:56 p. m. April 29, 1911, eight-tenths of a mile south of Martin's Creek Station, about ten miles south of Manunka Chunk, resulting in the death

of 13 persons and the injury of 101 persons, many seriously. The engineman, conductor and baggageman received injuries from which they soon died, and the fireman was seriously injured.

The train was running at a speed of about 50 miles per hour when the forward trucks of the tank car left the rails, immediately followed by all the other cars with the exception that the rear pair of wheels of the dining car was not derailed. None of the cars was telescoped. The train was thrown down an embankment on the east and outside side of a $2\frac{1}{2}$ degree curve, the engine, tender, and first car of the train turning over on their side, the remaining cars standing nearly upright.

The derailment was immediately followed by fire caused by the ignition of gas, evidently from a puncture in the gas tank under the third coach (No. 100) as well as from the escaping gas from the gas tanks under the other cars, which had their connections broken and permitted gas to escape. All cars were totally consumed by fire. The gas tank under the dining car exploded several hours after the wreck, which was caused by heat from the burning cars.

The section foreman had been throwing, or shifting, about 1,000 feet of track on this curve the day of the accident, and was engaged, at the time of the accident, in lining up and surfacing that portion of the track in the immediate proximity to the spot where the accident occurred.

The track is laid with 85 pound standard, steel rails, which had been in service for nine years, and showed from $\frac{1}{2}$ to $\frac{1}{4}$ inch wear. There were from 1 to 2 bad ties in the track for

for each rail length, and tie bars were used on each rail. Track is ballasted with gravel and cinders.

On the morning of April 29, 1911, acting under the instructions of the Supervisor of the Divisore Division of the Pennsylvania Railroad, the section foreman, with a force of seventeen men, was engaged in throwing, realigning and surfacing the curve south of the Ferry Crossing, about eight-tenths of a mile south of Martin's Creek Station, on the line stakes that had been set some months before.

The track at this point runs almost directly north and south with about $\frac{1}{2}$ to $1\frac{1}{2}$ grade toward the south. The curve is about $2\frac{1}{2}$ degrees, and has a super-elevation of about five inches for the east or outside rail.

The required work was to throw or shift the track from about two to nine inches at different points for a distance of about 1000 feet. The ballast was removed from the ends of the ties on the inside side of the curve for the distance necessary to permit of the throw or shift of the track to the proper alignment. After throwing this track by the use of bars and by easy stages of from one to two inches at a time to the proper alignment as indicated by the line stakes, the ends of the ties were tamped up with shovels, the section foreman then lined up and surfaced the inside rail, and had partially lined up and surfaced the outside rail.

The track, both north and south of as well as at the point of derailment, had been thrown from two to nine inches on the day of the accident. Track jacks were used at different places

on the curve in raising track to proper level, and the lining up and surfacing had not been completed.

At the time of the accident the men were engaged in filling up the center of the track and tamping up under the ties with shovels at a point just immediately north of the place where the derailment occurred. The track gauge was not used at any time in doing this work but the level board was used for the purpose of arranging proper superelevation and the necessary run-off leading to the same.

During the forenoon flagmen were used to protect this track in both directions, and after the noon hour a flagman was used to protect against trains from the north, until about 1:00 p.m., the time of the arrival of train 1st 573, after which time no flagman was used. Three trains passed over this track between 1:00 p.m. and 2:36 p.m., the time 2d 573 was wrecked. None of them, however, was running at the rate of speed of the wrecked train.

Eyewitnesses of the accident say that the cars were derailed first. Some testified there was an explosion followed by the crash of derailment, others that the crash of derailment was immediately followed by an explosion, others say that the crash of derailment was all that they heard or saw. All agree as to the almost immediate presence of fire. Testimony as to the condition of the gas tank equipment disproves any theory of gas explosion on account of the fact that the gas tank under car No. 100, the one supposed to have exploded, had been punctured by some outside agency.

Two committees of experts selected by the Board of

Railroad Company made careful inquiry and investigation as to the cause of the accident, and agree as to it being a derailment of the forward trucks of the tender and agree, practically, as to where these trucks left the rail. They disagree as to the cause of the derailment. One committee reported the derailment as evidently caused by a combination of uneven and irregular track, the high speed of the wrecked train while passing over the track, and the probable failure of the section men to have proper super-elevation on the curve, together with suitable run-off leading to same, and sufficient ballast against end of ties on high side of curve. The other committee reported that track condition was such as would warrant them expressing the opinion that it was not the cause of the derailment.

An outside expert, who was on the ground May 24, gathering data and making measurements as to the condition of the track both at the point of the accident and at the curve just north of the accident, expresses the opinion that the cause of the derailment was the uneven and irregular condition of the track and the failure to have proper super-elevation on the curve, and run-off leading to same, causing the forward trucks of the tender to mount the rail, followed by the derailment of the other cars in the train.

Conclusion.

There can be no doubt from the evidence in this case, that the accident was a derailment, caused by an uneven, irregular, and insecure condition of track which would not permit a train to pass over it in safety at a speed of from 50 to 60 miles per hour, the rate at which this train was running.

It is our opinion that this piece of track should have been protected by flag, until the work was completed, that is, until the elevation of the high rail had been carried around the curve and properly run off at the same point the surfacing had been run off on the lower rail, and ballast replaced against the ends of the ties on the high side of the curve.

The rule, as interpreted by an official of the Pennsylvania Railroad Company, does not require flag protection in doing work of this character, and we believe such rule should be so amended as to leave no doubt as to the requirement of flag protection to all trains when the track is being shifted, realigned or thrown, or where such similar insecure conditions of track exist.

The fact that the cars in this train were of wooden construction, and that the lighting system used was gas, are evidently responsible for the great loss of life and the total destruction of the train by fire. Had the cars been of steel construction, or had electricity been used as the lighting system, it is certain the loss of life would not have been so great.