

December 17, 1912.

In re investigation of accident on the Norfolk & Western Railway, at Cooper, West Virginia, on October 20, 1912.

On October 20, 1912, there was a derailment of a passenger train on the Norfolk & Western Railway at Cooper, W. Va., resulting in the death of one employee and the injury of one employee, 5 mail clerks, and 12 passengers.

After investigation I beg to submit the following report:

The derailed train was through passenger train No. 15, running between Norfolk, Va., and Columbus, Ohio. It consisted of an engine, a mail car, a baggage car, 3 coaches, a cafe car and a Pullman sleeping car. The train crew consisted of Engineman Cowling, Fireman Reynolds, Conductor Walters and Flagman McClellan. This train left Bluefield, W. Va., at 5:10 a.m. At Bluestone, a station about ten miles from Bluefield, it received orders to use the eastbound track from Bluestone to Ruth, a distance of 1.9 miles. After a delay of ten minutes, train No. 15 left Bluestone and proceeded over the eastbound track 1½ miles, to Cooper, and was derailed at 8.52 a.m., at a point about 200 feet west of the station, while rounding a 16-degree curve.

Witnesses state that when the train struck the curve the tender started to turn over and within 100 feet it turned completely over, falling down an embankment on the outside of the curve. When it left the track the tender pulled the locomotive over on its side and also pulled the front end of the mail car off from the track. The momentum of the train pushed the mail

ear down the embankment clear of the track. The front truck of the baggage car was derailed. The baggage car and about two-thirds of the forward coach passed by the wreckage. The front end of the first coach was slightly damaged, but none of the following cars in the train was damaged.

The employees on this train estimated the speed of the train at the time of the derailment at 20 miles per hour or less. Eyewitnesses of the accident, however, one of whom had been employed for a number of years as an engineman, estimated the speed at from 35 to 40 miles per hour and stated that as the engine was about opposite the station the engineman began to use steam; when he did so it seemed to raise the tender from the trucks on the inside of the curve. There were no marks on the ties to indicate that the tender or engine was derailed before overturning. The statement that the tender was the first car to be derailed is supported by the manner in which the bar connecting the engine and tender was twisted.

On that part of the Norfolk & Western Railway where this accident occurred the curvature is very great. Going west from Bluestone over the eastbound track, the route used by this train, there is a curve to the south, followed by a long curve to the north around a mountain. Then there is a short curve to the south, which is followed by a 12-degree curve to the north. Just east of the station at Cooper there is a tangent about 100 feet long and then there is a 16-degree curve to the south. This curve of 16 degrees is 690 feet long and then the curvature for some distance is reduced to 10 degrees. The track follows the

Bluestone River from Bluestone to Cooper, and there is a descending grade toward the west of 0.5 per cent. At Cooper the track crosses the Bluestone River and there is an ascending grade 2.25 per cent to Ruth, a distance of $1\frac{1}{2}$ miles. The heaviest part of this grade is encountered just before reaching Ruth, and here a junction is made with the westbound track. The route usually followed by this train is over the westbound track from Bluestone to Ruth, but on the date of this accident it was detoured to run around a freight train. Leaving Bluestone the westbound track passes through a tunnel and over a high bridge at Cooper; then it runs around the south side of the mountain to Ruth, with an ascending grade of a little more than 1 percent.

The eastbound track from Bluestone to Ruth is laid with 100-lb. rails, with 18 or 20 oak ties to the rail. Shoulder tie plates are used, with 4 spikes to each tieplate, and the track is ballasted with slag and in places with slag and cinders. Owing to the creeping of the track the curvature at the point where the accident occurred varies from 16 to 18 degrees.

This curvature is protected by a guard rail and what are known as "C" boards which restrict speed of passenger trains to 25 miles per hour and of freight trains to 15 miles per hour. The superelevation of the outside rail varied from 3 to 4 inches. Assistant Superintendent Dawson stated that $3\frac{1}{2}$ inches was their standard superelevation for curves of this character, protected by guard rails and "C" boards.

The engine hauling train No. 15 was No. 594, Pacific type, weighing 196,253 pounds, distributed as follows: 130,613 pounds

on the drivers, 31,329 pounds on the front trucks, 34,308 pounds on the trailing trucks. It has a rigid driving wheel base of 12 feet, with a total wheel base of 30 feet, 6½ inches. It was built in 1907, and was given a general overhauling in May, 1911. The tires were renewed in July, 1912. The loaded weight of the tender was 116,600 pounds. The tender had a wheel base of 16 feet, 4 inches, and the total length of the tender was 23 feet, 2¾ inches. The height from the top of the rail to the top of the tender, with 18-inch side boards, was 9 feet 1¼ inches. The tender had about 3/8 of an inch side bearing play on each truck and the safety chains on each truck were in good condition. The trucks, wheels and flanges of the locomotive and tender were in good condition.

This derailment was caused by excessive speed of the train on a curve where speed restrictions were prescribed. Conductor Walters stated that before leaving Bluestone the engineman said the engine "was not much account and he did not know whether he would be able to get up the hill or not". It is probable that Engineman Cowling, fearing that he would be unable to get up the grade from Cooper to Auth disregarded the speed restriction at this point and maintained speed which proved to be too high for this curve.

At the time of the accident Engineman Cowling had been on duty 1 hour and 22 minutes, after a period off duty of nearly 48 hours. He was 49 years of age, and had been employed in railroad service as fireman and engineman for 27 years. He had been in passenger service for 11 years and was considered a competent

engineman, although he had the reputation among employees of being a fast runner

This derailment calls attention to the necessity for rigid adherence to prescribed speed restrictions.