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INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE NORFOLK & WESTERN RAILWAY NEAR LOFTON, VA., ON DECEMBER 7, 1924.

January 15, 1925.

To the Commission:

On December 7, 1924, there was a rear-end collision near Lofton, Va., on the Norfolk & Western Railway which resulted in the death of one employee and the injury of two employees.

Location and method of operation

This accident occurred about 1 3/4 miles south of Lofton, Va., which is located on the Shenandoah Division 76.7 miles north of Roanoke. That part of the Shenandoah Division extending between Roanoke and Shenandoah, Va., a distance of 133 miles, is a single-track line over which trains are operated by time-table and train orders, an absolute manual block being provided for passenger trains. Freight trains in the same direction are permitted to depart from stations 5 minutes apart.

Lofton is situated at the summit of a grade. Approaching from the north the grade is ascending for a distance of several miles and from Cold Spring to Lofton, a distance of 3.1 miles, the gradient varies from 1.03 to 1.8 per cent. Southward from Lofton the grade is descending for a distance of several miles, the maximum gradient being 1.7, and the gradient exceeding 1 per cent for a distance of approximately 7 miles. The gradient at the point of the accident was 1.6 per cent. Between Lofton and the point of accident the railway is located on a side hill and the roadbed consists of a series of short fills and cuts, the sides of the cuts on the east of the track ranging in height from 4 to 20 feet. There are also a number of curves with short tangents intervening. Beginning at the south switch of the passing siding at Lofton the track is tangent for 500 feet, then there is a 3° compound curve to the east 400 feet in length, followed by a tangent of 800 feet, a 1° 20' curve to the west 1,850 feet long, a tangent of 500 feet, a 5° compound

curve to the east 1,500 feet long, a tangent of 400 feet, a 4° compound curve to the east 800 feet long, a tangent of 1,500 feet, a 4° compound curve to the east, 1,200 feet long, and then tangent 400 feet to the point of accident. Because of the curvature and the bank of a cut rising above the east side of the track, the view of enginemen approaching the point of accident was restricted to a distance of less than 700 feet. The maximum speed of freight trains on this grade is limited by time-table rule to 25 miles per hour. This accident occurred at about 3.55 a.m., at which time the weather was clear.

Description

Trains involved in this accident were two southbound freight trains. Extra 1120 consisted of engines 1120 and 1143, 43 loaded cars, 1 empty car, and a caboose, in charge of Conductor Dean and Engineman Perdue and Wheeler. This train left Shenandoah at 1.45 a.m. and when passing Cold Spring at 3.33 a.m. received order No. 18, Form 19, as follows:

"Order No. 16 is annulled No. 86 meet (3) two extras 1145-1434, 1120-1143 south at Lofton. No. 86 take siding."

The following message was also received;

"Extra south will follow you away from Cold Spring (5) five minutes behind you. Look out for them."

When extra 1120 arrived at Lofton No. 86 was into clear and no stop was made. Extra 1120 had proceeded about 1 1/2 miles southward from Lofton when it came upon a burning red fusee for which a full stop was made. The train started again almost immediately and had proceeded about 1/2 mile farther when it stopped for a second fusee. A minute or so later the train started to move ahead again and had attained a speed of approximately 5 miles an hour when the collision occurred.

Extra 1145 left Shenandoah at 12.01 a.m., in charge of Conductor Price and Enginemen St. John and Painter, and consisted of engines 1145 and 1434, 32 loaded and 25 empty cars, and a caboose. At Waynesboro, about 20 miles north of Lofton, 15 cars from the rear of the train were set out. At Cold Spring Order No. 18, previously quoted, was received together with the following message:

"C&E extra 1145-1434 south.

"Get into clear at Cold Spring and let extra 1120 and 1143 south pass you at Cold Spring. You may follow extra 1130 and 1143 south away from Cold Spring (5) five mins. No. 86 cuts one engine out at Lofton, look out for him."

A few minutes after extra 1120 passed Cold Spring extra 1145 pulled out upon the main track and departed, according to the train sheet, at 3.38 a.m. As No. 86 was on the siding at Lofton, no stop was made at that point. On the descending grade south of Lofton when a speed of about 25 miles an hour had been attained, the brakes were applied and speed reduced to 15 or 18 miles an hour and the brakes were released just before reaching the station sign 1 mile south of Lofton. At this point a red fusee was found burning on the track, but it had not been observed before the brakes were released and instead of stopping for this fusee as required by rule the train continued down the grade, passed a flagman about 15 rail lengths from the rear end of the preceding train and while running at a speed estimated to have been about 20 miles an hour, collided with that train at a point about 4,300 feet south of where the fusee was found.

As a result of the collision the caboose of extra 1120 was almost completely demolished and the first two cars ahead of it were derailed. Engine 1145 was separated from its tender, turned completely around, and thrown clear of the track down the embankment to the right. The tender was thrown clear of the track on the opposite side. Engine 1434 was overturned and came to a stop on its right side at an angle of about 45° to the track with its pilot jammed against the drivers of engine 1145. The employee killed was the fireman of engine 1434.

Summary of evidence

Engineman Perdue, of the leading engine of extra 1120, stated that it was about 3.46 a.m., when he started down the grade south of Lofton. He understood the light engine from train No. 86 had preceded his train but did not see its headlight. However, expecting to encounter a flag or a fusee, he proceeded with caution and came upon a fusee about 1 1/2 miles south of Lofton.

He brought his train to a stop, and started again as soon as the brakeman had extinguished the fusee. A short distance farther he encountered another burning fusee and overran that one about 3 car lengths before coming to a full stop. After about one minute the train again started to move forward and after moving about 3 car lengths while running at a speed of 5 or 6 miles an hour the train surged ahead and the brakes were applied in emergency, due to the collision. He stated that his train did not exceed a speed of 25 miles an hour at any time while descending Lofton grade and that in making the first stop he made a brake pipe reduction of about 20 pounds. After releasing the brakes he had regained his normal brake pipe pressure and had no difficulty in controlling the tran or making the second stop. He thought the collision occurred at 3.55 a.m. He stated that on light tonnage trains on Lofton grade retainers are not used and a general understanding exists between officials and employees that the timetable rule requiring the use of retainers was not expected to be literally observed. His statement was corroborated in all essential features by the fireman and head brakeman, as well as by the engineman and fireman of the second engine.

Flagman Mohler, of extra 1120, stated that after his train had proceeded about 1 mile south of Lofton he left the brakes applied and the speed reduced. He immediately prepared to get off, and threw off a lighted fusee near the station-one-mile sign. Before his train came to a stop he dropped off and started back to flag; he had gone back 3 or 4 car lengths when he heard the brakes release and the conductor called him. He caught the caboose and a short time afterwards felt the brakes applied a second time. He again started back to flag and was running back when he saw the following train round the curve and come out of a cut about 1,000 feet away. His stop signals were not acknowledged, although he heard the engineman sound a road crossing signal about the time the train came into view. He said the train passed him at a speed of about 25 miles an hour and that there was no fire flying from the wheels or other indication of the power brakes being applied.

Conductor Dean, of extra 1120, stated that when his train made the second stop he was standing on the rear platform and saw Flagman Mohler drop off and start back on the run to flag. At about the same time he saw the headlight of the following train as it rounded the

curve just north of a road crossing. As his train was already moving he did not think it would be overtaken, but his train had attained a speed of not more than 4 to 6 miles an hour when the collision occurred. With regard to the use of retainers on this grade, he understood that the time-table rule was obsolete and not required to be literally observed.

Engineman St. John of the leading engine of extra 1145 south, stated that he passed Lofton at about 3.51 or 3.52 a.m. He was under the impression that he would follow the light engine from train No. 86 down the hill instead of extra 1120, although he had no knowledge or assurance that the light engine had not preceded the extra. After his train had started down the grade and attained a speed of about 25 miles an hour he made a brake application, reducing speed to about 15 or 18 miles an hour. He said his first brake pipe reduction was between 5 and 7 pounds and that he continued to make other reductions until he had reduced brake pipe pressure to 30 pounds. Just before reaching the station sign one mile south of Lofton he released his brakes and shortly thereafter passed over a burning red fusee He applied the engine brake but on account of the depleted brake pipe pressure he was unable to stop. After proceeding about a train length, when brake pipe pressure had been increased to 60 pounds, he made another reduction, about the time he rounded the curve and came in sight of the road crossing just north of the point where the collision occurred his fireman called "red flag" and he saw the rear end of the train just ahead, and he then placed his brake valve in emergency position, sounded the whistle signal for brakes, turned on the sand blower, and jumped from his engine just as the collision occurred. He stated that he did not see the fusee near the station sign until about the time his engine passed over it. His view of the track ahead had been restricted by a cut and a curve, and at this time the fireman was washing off his side of the engine cab and deck and steam from the sprinkler hose which had frosted the window glass also obscured his view. However, he was under the impression that he was following the light engine down the grade instead of the extra and thought the fusee indicated the light engine intended to turn at a wye located a mile or more farther south, as that would give him ample time and distance in which to bring his train under control he did not call for assistance in controlling the train and he intended to stop at a bridge near the wye. He stated that had it

not been for the impression that he was following the light engine he would have handled his train differently. With respect to the use of retainers he stated that it is the general practice to turn up retainers on trains consisting of heavily loaded cars. Engineman St. John said that at Shenandoah he received a report that brakes were operative on all cars in his train and he had no difficulty in controlling it between that point and the point of accident.

Fireman Hackworth, of the leading engine of extra 1145, stated that after leaving Lofton he started to wash off the deck of the engine and while doing this the engineman applied and released the brakes, a release being made in the vicinity of the station sign one mile south of Lofton. Shortly after this he heard the engineman attempt to apply the brakes again and looked out from the left side of the engine but did not see anything ahead. When the crossing signal was sounded he started ringing the bell, saw the flagman and caboose ahead, called a warning to the engineman and then told the brakeman to get off as he knew it would be impossible to stop. He said he thought the caboose was not more than 18 or 20 car lengths away when he first saw it and he estimated the speed at from 15 to 20 miles an hour at the time of the collision. He said he did not see the burning fusee which his train passed about 1 mile south of Lofton and he thought his train had traveled not more than a train length after the brakes were first released until they were again applied and that they were applied when the collision occurred. He did not think the steam in the cab was sufficient to interfere with the view ahead.

Head Brakeman Cromer, of extra 1145, stated that on Lofton grade he was standing behind Engineman St. John but paid no particular attention to the operation of the brakes. He thought the train was running rather fast in view of the fact that it was following another train so closely, but he said nothing about it to either the fireman or the engineman and did not take a position in the engine where he would have a better view of the track ahead. With respect to retainers he understood that retainers were required to be turned up only on heavy tonnage trains.

Engineman Painter, of the second engine of extra 1145, stated that after the train had proceeded about 1/2 mile down Lofton grade the engineman of the leading engine applied the brake, making a reduction of 10 or 15 pounds and slowed the train down to

about 15 miles an hour. Almost immediately after releasing he applied the brake again and he noticed that they ran by a red fusee. Shortly afterwards the fireman called that there was a flag and caboose ahead and at about that time the engineman of the head engine placed his brake valve in emergency position. He estimated the speed at the time of the collision at about 20 miles an hour. He stated that if brake pipe pressure had been reduced to 30 pounds as claimed by Engineman St. John, he would have noticed it and the train would have been stopped. While operating the second engine he had observed and did not approve of the manner in which Engineman St. John handled his brake. On the preceding trip northward and on this trip southward he had run by water tanks at three places and he did not take advantage of the holding position of the brake valve on grades. He stated that had he been operating the leading engine he would have stopped for the fusee. He further stated that had Engineman St. John called for assistance he could have aided him materially in retarding the speed of the train by using his independent brakes and reversing his engine. In his opinion emergency effect was not obtained when the brake valve was placed in emergency position just before the accident as the auxiliaries had not been sufficiently recharged. With respect to retainers he stated that it was a practice to use them on Lofton grade on heavily loaded trains but not on short or miscellaneous trains.

Conductor Price, of extra 1145, stated that he thought the speed of his train as it turned over the summit was about 25 miles an hour. The engineman applied the brakes about 1 mile south of Lofton, reducing the speed to about 20 miles an hour and then released, he did not again apply them until just before the collision occurred, at which time he thought the speed was about 20 miles an hour. He stated that he was riding in the caboose after passing Lofton and so far as he observed the brakes were operated properly, although he did not notice how many reductions were made nor the amount of the reductions. He stated that the head brakeman on the morning of the accident was an extra man but had had considerable experience and he did not consider it necessary to give him any instructions relative to the use of retainers on Lofton grade. In his opinion the use of retainers on trains of the character which he was operating that day was unnecessary.

Flagman Blankenship, of extra 1145, stated that as the train turned over the summit he noticed the gauge in the caboose registered 70 pounds brake pipe pressure but he did not again notice its indication. The first application after passing Lofton reduced the speed of the train from 15 to 7 or 8 miles an hour and the speed then increased to 20 or 25 miles an hour, at which speed it was running at about the time a burning fusee was passed 1 mile south of Lofton. There was no other application of the brakes until just before the collision.

On the grade where this accident occurred the time-table rules provide for turning up 20 retainers on full tonnage trains and a proportionate number on other trains. Superintendent Ayers stated, however, that observations by division officers have developed that this number of retainers is not necessary for the proper and safe handling of trains down that grade and it is the general understanding among enginemen and trainmen that the number of retainers, if any, to be used is left entirely to their judgment. He stated that investigation has disclosed that on only a very small percentage of trains are any retainers used; that the majority of enginemen prefer to control trains with the automatic and independent engine brake without the use of retainers except when they have solid trains of heavy commodities which is a rare occurrence.

Rule No. 11 of the Operating Department reads as follows:

> "A train finding a fusee burning on or near its track must stop and extinguish the fusee, and then proceed with caution prepared to stop short of train or obstruction."

Superintendent Ayers stated that efficiency or surprise tests are conducted on the Shenandoah Division at intervals each month, these tests including the observance of torpedoes, fusees, automatic signals and train orders. Reports for the month of September indicate 62 tests with no violations and for November 58 tests with no violations.

Conclusions

This accident was caused by the failure of Engineman St. John to stop when he encountered a red fusee and then to proceed with caution prepared to stop short of train or obstruction as required by rule.

Contributing causes were the failure of Engineman Painter of the second engine of extra 1145 to take any action to bring his train to a stop or under control when he knew that it was being operated in violation of the rules, and the failure of all employees on both locomotives of this train to maintain a proper lookout while descending the grade on which the accident occurred.

The statement of Engineman St. John offers two possible explanations for his failure to stop for the red fusee and properly control his train thereafter In the first place he states that in making the first application on the descending grade south of Lofton he reduced brake pipe pressure by successive reductions to 30 pounds, released just before he saw the fusee and because of depleted pressure was unable to stop. The evidence, however, establishes the facts that he did not begin to apply the brakes until he had reached a point approximately 1/2 mile south of Lofton and that he released before reaching the station sign 1 mile south of Lofton. At the estimated rate of speed at which this train was running this operation occurred in a period of about two minutes or less. Had such a heavy brake pipe reduction been made a full service brake application would have resulted and it is believed the train would have been stopped or its speed reduced to a very low rate. The statement of Engineman St. John in this respect is not supported by evidence furnished by other employees who were in position to know how the brakes were operated and should have noted any such unusual operation as Engineman St. John's statement indicates. If Engineman St. John's statement were true he should not have released but should have brought his train to a stop in order to recharge the train brake system. The second possible explanation is suggested by Engineman St. John's statements that he had released the brakes just before he saw the red fusee, that he thought he was following the light engine down the grade, that he expected he would find the light engine at a wye some distance ahead, and that he intended to stop at a bridge near that point; further, that had he not assumed that he was following the light engine he would have handled his train differently. The first of these possible explanations indicates either gross carelessness or utter incompetence in the operation of brakes; the second indicates a deliberate disregard of a danger signal indication and a rule requiring a train to be stopped before passing it.

In either event the primary responsibility for this accident rests upon Engineman St. John.

According to the statement of Engineman Painter, he was fully aware of the fact that his train passed a red fusee without stopping, and during this investigation he criticised the manner in which Engineman St. John had previously operated the brakes. Notwithstanding these facts, however, he took no action whatever to call Engineman St. John's attention to the fact that he had run by a stop signal and did not pay sufficient attention to the operation of the brakes thereafter to enable him to know definitely how the brakes were being operated or whether his train was under control. From his own statement he was well aware that his train should have stopped for the red fusee. His judgment as an experienced engineman should have impelled him to take proper action to bring his train to a stop as quickly as possible after passing the fusee, and had he done so this accident could have been averted.

The investigation disclosed that there were five employees on the two locomotives of extra 1145 and none of them maintained a proper lookout on the descending grade south of Lofton. Both firemen began to sprinkle the engine decks after starting down this grade with the result that steam and frosted window glass partially obscured the vision and at times many, if not all, of these employees were not in position where a proper lookout of the track ahead could be maintained, even after passing the red fusee. For this condition Enginemen St. John and Painter are also responsible. Had a proper lookout been maintained both the red fusee and the flag should have been discovered in time to permit their train to be stopped before passing it.

Rule No. 34 reads as follows:

> "34. The engineer and fireman must, when practicable, communicate to each other by its name the indication of all signals affecting the movement of their train."

This rule was not obeyed by either Engineman St. John or Engineman Painter when the fusee was passed in this instance.

As a result of this investigation it appears that the railroad company has permitted trains to be operated upon this grade entirely without the use of retainers. It is believed that proper precautions are not provided when it is attempted to control trains on a grade of this character without using retainers. Had retainers been used on a proper proportion of the cars in extra 1145, better control of this train would have been possible and a greater degree of safety would have been provided.

Had an adequate block signal system been in use on this line this accident probably would not have occurred; an adequate automatic train stop or train control device would have prevented it.

All of the employees involved in this accident were experienced men and none of them was on duty in violation of the provisions of the hours of service law.

Respectfully submitted,

W. P. BORLAND

Director.