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INTERSTATE COMMERCE COMMISSION.

**REPORT OF THE CHIEF INSPECTOR OF SAFETY APPLIANCES
COVERING HIS INVESTIGATION OF AN ACCIDENT WHICH OC-
CURRED ON THE PITTSBURGH, CINCINNATI, CHICAGO & ST
LOUIS RAILWAY NEAR BOWERSTON, OHIO, ON DECEMBER 13,
1912**

FEBRUARY 15, 1913

To THE COMMISSION

On December 13, 1912, there was a rear-end collision on the Pittsburgh, Cincinnati, Chicago & St Louis Railway near Bowers-ton, Ohio, which resulted in the death of 1 employee and the in- jury of 1 employee. After investigation of this accident and of the circumstances connected therewith, I beg to submit the following report.

The division where this accident occurred is a double-track line operated under the block system. Some portions of the line are equipped with automatic block signals and other portions with manually operated block signals. Manual signals are in use on that portion of the road where this accident occurred.

The trains involved in the collision were extras 8060 and 8188. Extra 8060, consisting of engine No 8060, 17 loaded and 26 empty cars and a caboose, in charge of Conductor Sell and Engineman Carter, left Pitcairn, Pa., for Dennison, Ohio, at 7 05 a m., December 13, and passed O B tower, the first block station east of Bowerston, at 4 58 p m. After proceeding westward until its rear end was about 1,500 feet west of O B tower and 1,000 feet west of the home signal, this train was stopped behind extra 8469, which train in turn was being held by extra 8012 (a local freight train), which was doing work at Bowerston station. Extra 8060 stopped behind extra 8469 at about 5 p m. and at 5 12 p m., after having been standing about 12 minutes, it started to proceed westward, but had moved ahead only about one car length when the collision occurred.

Extra 8188, consisting of engine No 8188, 23 loaded cars and a caboose, in charge of Conductor McDonald and Engineman Stocker, left M N tower, West Virginia, for Dennison, Ohio, at 3 20 p m. It passed Sci0, the second block station east of the point where the col- lision occurred at 5 06 p m., and traveled the distance of 5 16 miles to the point of collision in six minutes, or at an average speed of about 51 miles per hour, colliding with extra 8060 at 5 12 p m.

The impact of the collision practically demolished the caboose and 4 cars of extra 8060. Engine No 8188 was derailed and turned on its side to the right of the westbound track, and the four head cars in extra 8188 were badly damaged. The westbound track was badly damaged and both main tracks were blocked for several hours. Engineman Stocker was killed, and Brakeman Gump, who was riding on engine No 8188 at the time, was slightly injured. Fireman Wagner of engine No 8188 jumped off just before the collision occurred and escaped injury. The grade at the point of collision is about 0.23 per cent descending westward, but between Scio and O B tower the track is practically level. It was dark at the time of the accident, but the weather was clear.

When extra 8060 stopped, Flagman Wheeler immediately went back, taking with him his lanterns, torpedoes, and a red fusee. He went back to a point about 400 feet east of O B tower and placed two torpedoes on the rail 1,900 feet from the rear end of his train. He then returned to the tower to inquire of the towerman why his train was being held, and upon being told that the local was causing the delay, he left the tower, just at which time a whistle signal was sounded for him to return to his train. Extra 8188 had not at that time been reported by Scio, 4.9 miles east of O B tower. Upon hearing the signal to return to his train, Flagman Wheeler lighted a red fusee and placed it on the track immediately in front of the tower, 1,500 feet to the rear of his caboose, and ran toward his train. Upon approaching the train he signaled Conductor Sell to go ahead. The latter in turn signaled Engineman Carter, and the engineman answered the signal, but on account of having to take slack he did not succeed in getting the train started until about a minute after he answered the signal.

Brakeman Gump, of extra 8188, stated that he was riding on the fireman's seat box on approaching O B tower. The distant signal showed clear, and about the time the engine passed it he saw the glare of the burning fusee and called it to the attention of Engineman Stocker. He said that Stocker immediately shut off steam and applied the air brakes in emergency.

Fireman Wagner stated that he was in the gangway of engine No 8188 and saw the red fusee about the time Brakeman Gump called it to the engineman's attention, and that the engine was just about at bridge No 82, which is located about 1,100 feet west of the distant signal and 350 feet east of O B tower, when the engineman shut off steam and applied the air brakes. This bridge is 1,830 feet distant from the point of collision.

Conductor McDonald, of extra 8188, stated that his train had been running on white blocks, and that just prior to the collision it was running about 50 miles per hour. He said that at the speed his train

was running it would have required at least one-half mile in which to stop, and that the flagman should have been back to the distant signal where he could have seen an approaching train for nearly a mile, he said that his caboose was about at bridge No 82 when he felt the brakes applied. If he had been the flagman he would have gone to the telegraph office and asked the operator if anything was by Scio, and if so would have instructed him to display a green distant signal.

Operator Bowers at O B tower stated that Flagman Wheeler went back to a point just east of bridge No 82 and then returned to the tower. At the time the flagman left the office he did not have a report of extra 8188 being by Scio, but shortly afterwards Scio reported extra 8188 by at 5 06 p m. The train passed O B tower about 5 12 p m, running at a speed of 50 miles an hour. He heard the explosion of two torpedoes as engine No 8188 passed over them west of bridge No 82, where the flagman stopped before returning to the tower, and the fusee in front of his tower was still burning red when engine No 8188 passed over it.

The block system in use on this division is absolute for passenger trains and permissive for freight trains. The rules governing the operation of the absolute block furnish protection to passenger trains, but the rules and methods in force for authorizing permissive movements for freight trains do not provide adequate protection.

The signals in use are of the semaphore type, operating in the lower quadrant. The home signal has three positions, namely, danger, caution, and clear. Its normal position is horizontal, indicating danger or stop, showing a red light at night. When at 45° below the horizontal, showing a green light at night, the signal indicates caution, and may be passed by an engineman with his train under control, expecting to find another train somewhere within the block. When at 90° below the horizontal, showing a white light at night, the signal indicates clear block, and may be passed at full speed. The distant signal has two positions, namely, caution and clear. Its normal position is horizontal, indicating caution, showing a green light at night. The clear position of the signal is 90° below the horizontal, showing a white light at night. With the distant signal in caution position the engineman of an approaching train has positive information that the home signal indicates danger and his train must be brought to a stop before passing it, but with the distant signal in the clear position no positive information about the position of the home signal is furnished, as in that event the home signal may indicate either caution or clear.

Under the rules a freight train may enter a block occupied by another freight train without any notice of the condition of the block other than a caution indication at the home signal. When a train

enters a block and its rear end has passed 300 feet beyond the home signal, the towerman at the entrance to the block is required to report the train and the time to the block station ahead and in the rear. If the entering train is a freight train, the towerman may then immediately display a clear indication at the distant signal and permit another freight train to enter the block with a caution indication at the home signal, although the preceding train may have stopped with its rear end less than safe braking distance from the home signal.

In this case there were three trains in the block west of O B tower, with the caboose of the rear train only 1,000 feet west of the home signal. The markers on the rear of this train had passed out of sight of the towerman, and he obeyed the rules and acted in accordance with the prescribed methods of signaling in displaying a clear distant signal to extra 8188.

The signals controlled from O B tower are not well located, and the facilities for insuring safety of train movements in that vicinity should be materially improved. The tower is equipped with a four-lever interlocking machine used to operate the home and distant block signals, two in each direction. There are two passing track switches and a crossover switch located between the distant signals. These switches are not controlled from the tower. No track circuits are used, and the tower is not equipped with bells, indicators, signal repeaters, or track diagram. The home signals, both east and west bound, can be seen by the towerman both day and night. The westbound distant signal can be seen by the towerman only in the daytime, and the eastbound distant signal can not be seen by him either day or night.

The distant signal for the westbound block controlled from O B tower is located at the west end of a tangent about 1 mile long, and can be seen by the engineman of an approaching train the full length of the tangent. This distant signal is 1,463 feet east of O B tower and 1,968 feet east of the home signal. Proceeding westward from this distant signal toward Bowerston the track curves to the left for a distance of about 2,500 feet in an arc of $3^{\circ} 12'$, then follows about 140 feet of straight track, succeeding which is a similar curve to the right. About 500 feet of the track at the west end of the first curve west of the distant signal lies in a cut 20 feet deep. O B tower is located to the right of the track at the east end of this cut and the home signal for the westbound block is located 505 feet west of O B tower, at the west end of the cut. On account of the curve and the high bank on the south side of the track, the home signal can not be seen by the engineman of an approaching train until after his engine has passed some distance beyond the tower. On some types of engines

the home signal can not be seen from the engineman's side until the engine is almost upon it

The distant signals controlled from O B tower are wire connected and are fitted with four lens castings. The upper lens space is closed with a metal disk, the next lower space has a green lens, the next lower one has a metal disk, and the bottom space is open so as to uncover the white lens of the signal lamp when the semaphore blade is 90° below the horizontal. With this arrangement these signals would show no light to the engineman of a train approaching at night should the semaphore blade be placed in a position approximately 45° below the horizontal. This condition would result should the towerman fail to pull the signal lever all the way over or should the connection of the signal to the lever be out of adjustment. With such a condition existing an engineman might easily miss the distant signal entirely and unexpectedly run onto a stop indication at the home signal, which he would be unable to see until but a short distance away from it.

All the evidence is that extra 8188 was running at a much higher rate of speed than is permitted by the company's regulations. Rule No 6, on page 54 of time-table No 5 of this division of the P, C, C & St L Ry, effective November 24, 1912, prescribes 40 miles per hour as the maximum speed for freight trains at all points on the division, except at places where lower speed is required. Previous to the date when time-table No 5 became effective there was no speed restriction covering that portion of the road where this accident occurred, and as the physical condition of the road for a distance of 9 miles to the east of O B tower is favorable, it has long been customary for freight trains to maintain high speed on that piece of track.

An examination of the train sheet covering the movement of freight trains, both east and west, between O B tower and B A tower, 8.9 miles east, indicates that the speed restriction established by time-table No 5 has been habitually disregarded. The train sheet kept by the operators at Scio shows that from November 24 to December 31, 1912, a period of 38 days, omitting December 14, the day following the accident, there were 903 westbound through freight movements. Of this total 112 (12.5 per cent) exceeded the speed limit from B A tower to Scio, and 185 (20.4 per cent) exceeded the limit from Scio to O B tower. During this period an average of three westbound trains per day exceeded the speed limit between B A tower and Scio and five westbound trains daily exceeded the limit between Scio and O B tower. The record for December 4, 1912, shows that three trains on that date covered the 4 miles from B A tower to Scio in 4 minutes, or at a speed of 60 miles per hour. The record shows numerous cases where a speed of 60 miles per hour

was made between Scio and B A tower, and several cases where the 8.9 miles from B A to O B towers were covered in 10 minutes, or at an average speed of 53.4 miles per hour.

The evidence is that extra 8188 had been running on clear signals, and when the engineman observed the clear distant signal on approaching O B tower it was natural for him to assume that the home signal also would indicate clear, permitting him to pass it at speed. When passing the distant signal at a high rate of speed his attention was called to the red fusee burning in front of the tower. This was his first warning that the block ahead was occupied. At about the same time he ran over the torpedoes which had been placed on the track by the flagman. These torpedoes were 1,900 feet from the rear of extra 8060, and the red fusee was 1,500 feet from its rear. The evidence is that the air brakes on extra 8188 were operating properly, and the warning received by the engineman should have been sufficient to enable him to stop his train before striking the train ahead had he observed the speed regulation in force. Operator Bower stated that when the train passed his tower (which was after the brakes had been applied) it was running 50 miles per hour.

The direct cause of this accident was the failure of the towerman at O B tower to give the engineman of extra 8188 a caution indication at the distant signal. Had this been done the accident would not have occurred. However, the towerman observed the rules in displaying a clear distant signal, and is subject to criticism only for exercising bad judgment, especially so when a five-minute red fusee was burning directly in front of the tower. His action in this case but serves to emphasize the weakness of the method of signaling employed by the railroad company for the protection of its freight trains, as all the employees involved in this accident are positive in the statement that had a caution indication been displayed at the distant signal the train could have been brought to a stop in time to avoid the collision.

Had these signals been controlled by an electric track circuit extending from the distant signal to a point at least safe braking distance in advance of the home signal, the towerman at O B tower would have been compelled to hold the distant signal at caution and the home signal at danger until the rear end of extra 8060 had passed into the block a sufficient distance to insure safe braking distance for an entering train.

The traffic on this division is heavy enough to justify the use of automatic block signals its entire length. On this division between Pittsburgh and Dennison, a distance of 90.5 miles, there are 46 miles of straight manual block, 21.9 miles of manual block with all tracks equipped with automatic spacing signals, 16.2 miles of manual block with one track equipped with automatic spacing signals, and 6.4 miles

of straight automatic block. These automatic signals are distributed throughout the manual block territory in short sections, and the problem of placing automatic signals on the entire division is simply a question of tying the loose ends together. With automatic signals in use all trains would be given protection.

Contributing causes of this accident were the failure of Engineman Stocker to observe the rule limiting the speed of freight trains to 40 miles per hour, and the failure of Flagman Wheeler to continue back toward the distant signal until called in to his train, instead of returning to the tower after placing the torpedoes east of bridge No 82. Had he kept on going back he probably would have been able to place the fusee 1,000 feet farther east than he did. This would have given the engineman of extra 8188 earlier warning and he would have had more opportunity to stop his train.

Engineman Stocker's violation of the speed regulation is a matter for which the operating officers of this division of the P, C, C & St L Ry are in great measure responsible. That enginemen on this division pay no attention to the established speed restriction is a matter of daily record, and their failure to observe the rule must have been known and acquiesced in by the operating officers. Such dereliction of duty by those who are charged with the enforcement of regulations can not fail to weaken respect for all rules and render nugatory all efforts to maintain really effective discipline. Rules that are not intended to be enforced have no proper place in a railroad company's code of regulations, and when the operating officers of a railroad permit rules that have been enacted to secure safety to be violated with impunity, they can not reasonably expect to escape responsibility for the consequences of such violation.

With regard to Flagman Wheeler's failure to go back farther, it may be noted that he violated no rule. In stopping 1,900 feet to the rear of his train he evidently exercised his best judgment as to what was a sufficient distance to insure full protection. His error in judgment but serves again to illustrate the weakness of the company's flagging rule (Standard Code Rule No 99), which reads as follows:

When a train stops or is delayed under circumstances in which it may be overtaken by another train the flagman must go back immediately with stop signals a sufficient distance to insure full protection. When recalled he may return to his train, first placing two torpedoes on the rail when the conditions require it.

The only absolute requirement of this rule is that a flagman must go back immediately with stop signals. How far he shall go back, and whether or not he shall use torpedoes, are matters that are left entirely to his judgment of what the particular situation requires. When considered in connection with safety in the movement of trains, the flagging rule is of paramount importance, and its require-

ments should be as absolute as it is possible to make them. It should be incapable of more than one construction, entirely free from uncertainty or indefiniteness, leaving no room for error of judgment by a flagman when such error may prove disastrous.

At the investigation held by the railroad company it was stated that Flagman Wheeler should have gone back to the distant signal, where he could have seen an approaching train for a distance of 1 mile. In connection with this statement two things should be noted. First, the flagman did not have time to go back as far as the distant signal before being called in to his train, and, second, extra 8188 had not been reported by Scio when he left O B tower, after having been signaled to return to his train. Extra 8060 had been standing but 12 minutes before the collision occurred. In that time the flagman went back 1,900 feet, returned to his train, and had been back there about 1 minute before the accident happened. He therefore traveled 3,800 feet in about 11 minutes, during which time he placed two torpedoes on the rail, lit a fusee and placed it on the track, and went into the tower to ask a question of the operator. Assuming that he had kept on going back instead of returning 400 feet to the tower after putting down the torpedoes, he probably would have reached a point six or eight hundred feet farther back before being signaled to return to his train, but he would still have been several hundred feet short of the distant signal.

Flagman Wheeler entered the service of the P, C, C & St L Ry as a freight brakeman on June 24, 1910. He had been laid off twice on account of reduction in force, the last date of his reemployment being April 13, 1911. His record is clear.

Engineman Stocker was employed as a fireman on July 17, 1899, and was promoted to engineman on August 27, 1906. On March 3, 1907, he was reprimanded for running by a red home signal, and on February 9, 1911, he was suspended 30 days for a rear-end collision after being flagged. He had also been reprimanded for minor offenses on three other occasions.

Towerman Bower was employed as a telegraph operator on December 18, 1903. He was suspended for 30 days on September 1, 1906, for displaying a clear signal to an entering train when the block was occupied, and on April 21, 1907, he was suspended one week for displaying a wrong block indication at O B tower.

None of the employees involved in this accident was on duty in violation of the hours of service law.

Respectfully submitted

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Chief Inspector of Safety Appliances.