

INTERSTATE COMMERCE COMMISSION

REPORT OF THE CHIEF OF THE BUREAU OF SAFETY IN RE INVESTIGATION
OF AN ACCIDENT WHICH OCCURRED ON THE BOSTON & MAINE RAIL-
ROAD AT ROLLINSFORD, N. H., ON OCTOBER 8, 1922.

November 21, 1922.

To the Commission:

On October 8, 1922, there was a head-end collision between a passenger train and a freight train on the Boston & Maine Railroad at Rollinsford, N. H., resulting in the death of 1 employee, and the injury of 4 passengers and 4 employees off duty.

Location and method of operation.

That part of the Portland Division on which this accident occurred is a double-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The accident occurred approximately 338 feet west of the station at Rollinsford, on the westbound main track, within yard limits, at a branch-line switch located 20 feet east of the east switch of a crossover 183 feet in length, connecting the two main tracks. Approaching this point from the east there are more than 3,000 feet of tangent, then a 13-minute curve to the left 910 feet in length, followed by 2,629 feet of tangent extending to the point of accident, beyond which point this tangent extends for more than 500 feet. The grade for westbound trains for this distance is ascending, varying from 0.07 to 0.86 per cent for approximately 4,400 feet, and is then descending, varying from 0.20 to 0.74 per cent for about 2,750 feet; at the point of accident it is 0.74 descending. The branch-line switch mentioned above is a trailing-point switch for westbound trains, and leads off the westbound main track to the north to the Somersworth Branch, while both crossover switches are facing-point switches for trains moving with the current of traffic. The west and east yard-limit boards are located 1,200 and 3,628 feet west and east of the point of accident, respectively. Under the rules, extra trains must move within yard limits prepared to stop unless the main track is seen or known to be clear. The headlight of an eastbound train, standing on the westbound track at the point of accident, can be seen for a distance of more than 7,000 feet.

The automatic block signals are of the normal-clear, two-aspect, two-position, lower-quadrant type. Westbound signal D-706 is located 3,344 feet east of the point of accident, while 2,940 feet farther east is westbound signal D-710, this latter signal

being 600 feet west of Salmon Falls, the first station east of Rollinsford and $1\frac{1}{4}$ miles distant therefrom. The circuits are so arranged that the opening of either crossover switch at Rollinsford, or the branch-line switch at which the accident occurred, causes signal D-706 to indicate stop and signal D-710 caution. There is a manually operated signal 1,100 feet east of the station which was installed primarily for the protection of trains performing station or yard work. There is also a ball signal, located south of the main tracks, at a point 42.8 feet west of the point of accident, this signal is hand operated, and has two endless chains, one being located on each side of the mast. To one chain are attached two balls, located vertically with respect to each other, while there is only one ball attached to the opposite chain. All three balls are displayed when this signal is in the stop position, in which position the single ball is at the top of the mast head, while the uppermost ball, on the chain to which the two balls are attached is on the same level with the single ball, the other ball being directly beneath it. The night indication is one red light for each ball displayed. Rule 697 (c) under special instructions contained in time-table No. 51, effective September 24, 1922, reads as follows

Rollinsford. "One ball, or one red light, trains may pass in either direction on the main line. Two balls, or two red lights, trains from Somersworth Branch may come onto main line and proceed towards Dover, and also eastward trains may pass on main line, but stops all trains approaching Rollinsford from the east. Three balls, or three red lights; eastward trains may cross main line to Somersworth Branch, but stops all other trains.

All Somersworth Branch trains to or from the main line will make full stop within one hundred feet of nearest connecting switch before entering or crossing the same."

Rule 513 requires that a train moving from a siding to a main track protected by block signals must wait three minutes after opening the main-track switch before fouling the main track. This rule was considered to apply at Rollinsford, the ball signal being authority for crossover movements under rule 697-C, and protecting all trains.

There was a light mist at the time of the accident, which occurred at about 8.17 p. m.

Description.

Eastbound passenger train No. 1757, which is operated only on Sundays, consisted of 1 baggage car, 1 smoking car, and 1 coach, in the order named, all of wooden construction, hauled by engine 957, and was in charge of Conductor Lynch and Engineman Walker. This train left Dover, 2 $\frac{1}{2}$ miles west of Rollinsford, at 8.08 a. m., and on arrival at Rollinsford, at about 8.13 p. m., it was brought to a stop with the engine about 100 feet west of the crossover switch leading from the eastbound main track. After this switch was opened, the ball signal was set so as to display three lights, according to members of this crew and other witnesses, after which the crossover switch leading to the westbound main track was opened, followed by the opening of the switch leading to the Somersworth Branch. Train No. 1757 then moved through the crossover, however, on account of the approaching freight train, it was brought to a stop with the head end of the engine on the westbound main track at the branch-line switch, immediately after which, while standing at this point, it was struck by extra 3624.

Westbound freight train extra 3624 consisted of 37 cars and a cocoose, hauled by engine 3624, and was in charge of Conductor Thompson and Engineman Coynehan. This train passed North Berwick, 7.73 miles east of Rollinsford and the last open office, at 8.02 p. m., and collided with the passenger train while traveling at a speed estimated to have been between 25 and 30 miles an hour.

The impact forced the passenger train backward through the crossover a distance of about 160 feet. Both engines were badly damaged, while the tenders telescoped the first car in each train for a considerable distance; the second and third cars in the freight train were also derailed. The employee killed was the engineman of train No. 1757.

Summary of evidence.

On arrival of train No. 1757 at Rollinsford, after the engine was brought to a stop just west of the west crossover switch, Passenger Trainman Wiltshire went forward and opened this switch, at which time the ball signal was displaying one light; in order to display the proper signal while crossing to take the diverging route he raised the two balls attached to the opposite chain, crossed to the westbound track, and after looking eastward and seeing no train approaching, opened the east crossover switch and also the branch-line switch. After waiting on the eastbound track until the switch at which the accident occurred was opened, which was three minutes or more after the first switch was opened, train No. 1757 proceeded to cross to the diverging route. In the meantime, Passenger Trainman Wiltshire started walking eastward toward the station, and while so doing saw Caretaker Page, who is stationed at this point on Sundays, the office being closed,

give a stop signal to extra 2624, which was then close to the station and traveling at a speed of between 30 and 40 miles an hour; the accident occurred immediately afterwards. Passenger Trainman Wiltshire stated he also gave a stop signal to the approaching freight train. The statements of Passenger Trainman Wiltshire as to the order in which he performed his duties were practically corroborated by those of Caretaker Page, who added that it was about one minute after the branch-line switch was opened that he noticed extra 2624 approaching, at which time it was about opposite the mechanical signal east of the station. Fireman Saunders of train No. 1757 stated that had extra 2624 passed signal D-706 while train No. 1757 was standing on the eastbound main track it would have been plainly visible, also that his train waited a sufficient time to permit any westbound train that had passed this signal to have arrived. Conductor Lynch, who did not leave the train until just before the collision occurred, stated at the time he saw Passenger Trainman Wiltshire open the branch-line switch his train was standing on the eastbound main track. Caretaker Page, and all of the surviving members of the crew of train No. 1757, stated the ball signal was properly adjusted, with three red lights burning brightly, also it is the usual practice, as was done in this instance, for train No. 1757 to wait on the eastbound track until the entire route is lined for the diverging movement, which waiting time, in accordance with rule 513, consumed 3 minutes or more.

Conductor Emery, who was a passenger on train No. 1757, frequently has occasion to adjust the ball signal and stated on this trip it was properly set. He first saw extra 2624 while train No. 1757 was moving over the crossover, and at that time is positive it was very close to or east of signal D-706.

Engineman Moynihan, of extra 2624, stated he is familiar with the physical characteristics, also the switches and signals in the vicinity of the point of accident, but did not know that signal D-706 worked in conjunction with the crossover switches. He also knew that the track in the vicinity of the point of accident was within yard limits, but considered 30 miles an hour a safe speed through this yard. He stated the headlight of engine 957 interfered with his view of the ball signal, but that after passing signal D-706, which he said was displaying a clear indication, Fireman Gardner called "one ball" and he answered without having seen the ball signal, and he did not see it at any time prior to the accident, although it can be seen from signal D-706. The first knowledge he had of the crossover being in use was on receiving a stop signal from some one at the station, at which time the engine was working steam and the speed of his train was about 30 miles an hour.

Fireman Gardner, of extra 2624, said he saw signal D-706 displaying a clear indication, at which time he was about one-fourth of a mile from it, that after passing it he saw one ball signal displayed and after a second or two did not further observe the signal; at this time his train had passed the yard-limit board. The headlight of engine 957 did not interfere with his view and he thought there was no reason why if three ball signals had been displayed they should not have been visible as easily as one signal. Fireman Gardner also said that 15 or 20 minutes after the accident there were three red lights displayed. Conductor Thompson and Brakeman Shaffer, however, stated that on getting off the caboose immediately after the accident three lights were plainly visible on the call signal, the single ball being fully raised and the two calls raised part way, the appearance of the signal being such as to constitute a signal imperfectly displayed. Conductor Thompson consulted his watch immediately after the accident and it was then 3.17 p. m.

The air brakes on extra 2624 had been tested and were working properly, while a test made of signal D-706 immediately after the accident showed it to be in proper working order.

Conclusions.

This accident was caused by the failure of Engineman Moynihan and Fireman Gardner, of extra 2624, properly to observe and be governed by automatic block-signal indications and by the indication of the ball signal protecting crossover movements, and by the failure of the engineman to have his train under proper control within yard limits.

Engineman Moynihan admitted he did not see the ball signal at any time prior to the accident, although he called its indication to Fireman Gardner after passing signal D-706. Not only is the weight of evidence to the effect this signal was displaying three red lights, which required all trains on the main line to stop clear of the crossover switches, but it also appears that the switches were opened before extra 2624 reached signal D-706, and in view of the fact that nothing was found to indicate that the signal had displayed an improper indication, it is believed that it displayed a stop indication at the time extra 2624 approached, and for some reason this indication was not properly observed. Extra 2624 was traveling at a speed of about 30 miles an hour, with the engine working steam, when the engineman received a stop signal given by some one at the station, at which time his train was nearing the station and within yard limits. The rules require extra trains to move within yard limits prepared to stop, unless the main track is seen or known to be clear. If his view was restricted as much as he claimed, due to the headlight of engine 957 shining in his eyes, then it is obvious that Engineman Moynihan was flagrantly disregarding the yard-limit rule.

The ball signals at Rollinsford provide protection for movements to and from the Somersworth Branch. On either side of the station there are mechanically-operated, one-arm semaphore signals which, according to Acting General Superintendent Rourke, were installed to provide protection for work in the vicinity of the station such as the handling of baggage or the movement of an engine engaged in yard work; these signals are not connected with the automatic signal system, and may be thrown by any one whenever desired. The mechanical signal on the westbound track is about 1,100 feet east of the station and 1,900 feet west of automatic signal D-706. Under this arrangement of signals, the engineman of a westbound train can receive a stop signal at automatic signal D-706, which is a stop-and-proceed signal, and on his arrival at the mechanical signal find it displaying a clear indication, which might lead him to think the condition which caused the automatic signal to display a stop indication had been removed, or he might receive a clear indication at the automatic signal, causing him to think the track was unoccupied, and then receive a stop indication at the mechanical signal, which under the rules could not be passed except on the hand signals of a flagman sent ahead to ascertain the reason for the stop signal. The mechanical signal not being controlled by track circuits may, as in this instance, display a clear indication with a train on the main line within the limits which it governs, and if then mistaken for an automatic signal a dangerous condition would result. While in this case it is established that the signals governing crossover movements were properly set, it is noted that neither the mechanical nor the ball signals are in any way interlocked with the crossover, and it is possible to open the switches without first setting either of these signals at stop. Were the mechanical signals made a part of the automatic block system, or either the mechanical or ball signals interlocked with the switches, a greater degree of protection would be provided.

This accident again directs attention to the necessity for automatic train control devices which will intervene to stop a train in case the engineman fails to obey stop signals. Had such a system been in use on this line, this accident would undoubtedly have been prevented.

All of the employees involved were experienced men. At the time of the accident, the crew of train No 1757 had been on duty about 11½ hours, after 13 or more hours off duty; the crew of extra 2624 had been on duty about 4½ hours, after 8 hours or more off duty.

Respectfully submitted,

W. P. BORLAND

Chief, Bureau of Safety.