

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE  
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE  
BOSTON AND MAINE RAILROAD AT SHAWSHEEN, MASS., ON  
SEPTEMBER 14, 1929

November 22, 1929.

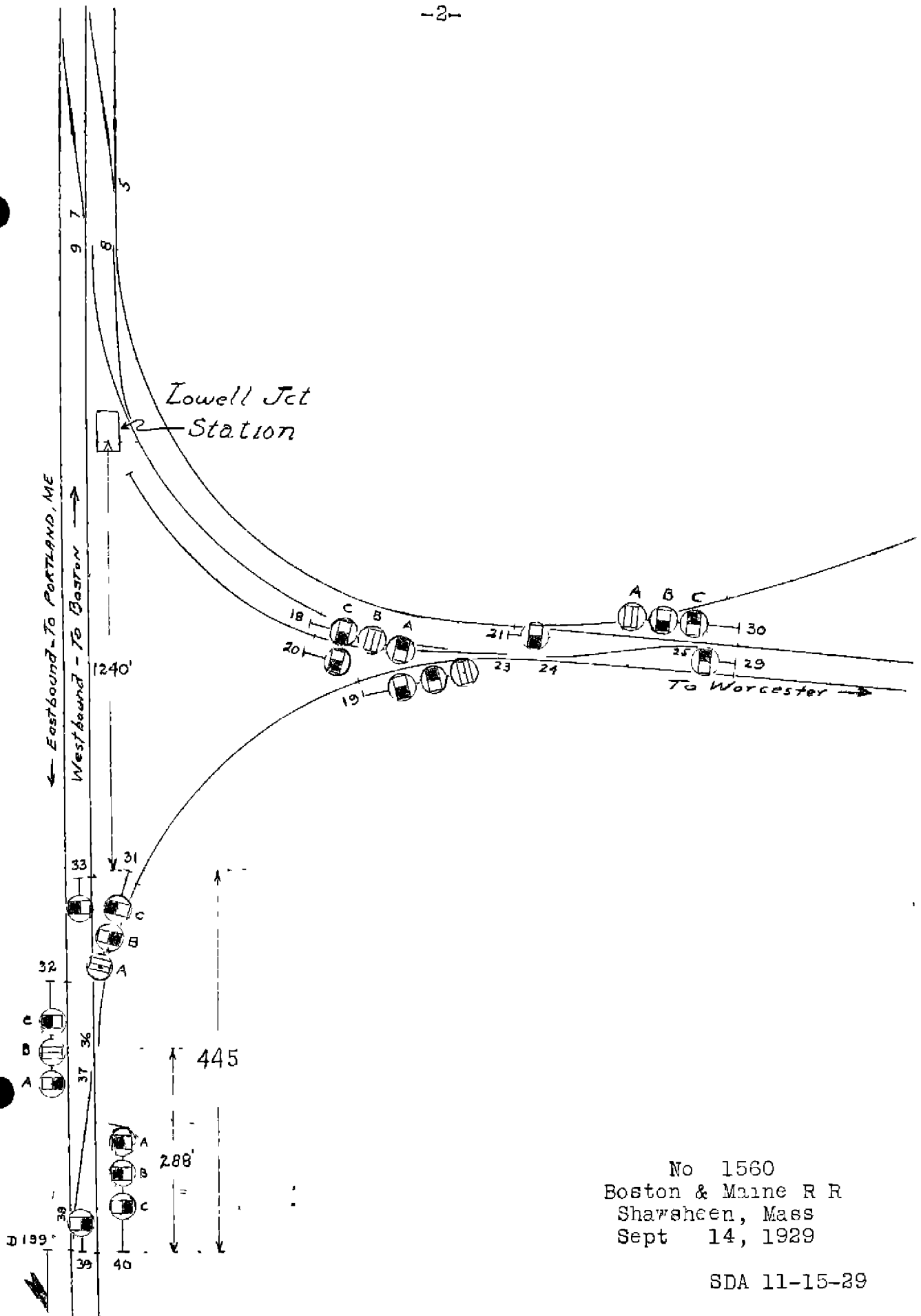
To the Commission.

On September 14, 1929, there was a head-end collision between a freight train and two light engines, coupled together, on the Boston and Maine Railroad at Shawsheen, Mass., which resulted in the death of two employees and the injury of six employees. The investigation of this accident was held in conjunction with representatives of the Massachusetts Public Service Commission.

Location and method of operation

This accident occurred on that part of the Portland Division extending between Lowell Junction, Mass., and Scarborough Beach, Me., a distance of 89.03 miles, in the vicinity of the point of accident this is a double-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The accident occurred at a point approximately 1,600 feet west of the station at Shawsheen, approaching this point from the west the track is tangent for a distance of 2,940 feet, followed by a  $10^{\circ} 39'$  curve to the left 1,750 feet in length, the accident occurring at the leaving end of this curve. Approaching from the east the track is tangent for a distance of 7,960 feet, followed by a  $0^{\circ} 57'$  curve to the right 1,980 feet in length, and then tangent track for a distance of 500 feet to the point of accident. The grade is 0.533 per cent descending for eastbound trains at the point of accident.

At Lowell Junction, 4.34 miles west of Shawsheen, the tracks of the Lowell branch connect with the main line of the Portland Division and form a wye in making this connection. The east leg of this wye is single track and connects with the westbound main track at a point 1,397 feet east of the tower, while at a point approximately 50 feet east of the wye switch there is a facing-point cross-over between the two main tracks; the switches and signals at this point are operated from an interlocking tower. The signals involved are interlocking signals 31 and 40, located 1,240 feet and 1,385 feet, respectively, east of the tower. These signals are of the semi-automatic color-light type, mounted vertically on high posts, the lights being designated, from top to



bottom, A, B, and C. Light A on signal 31 governs movements from the east leg of the wye eastward to the westbound main track and is fixed to indicate stop at all times, while lights B and C are used in crossover or diverging movements. Signal 40 is connected with the automatic block-signal circuit and governs movements westward on the westbound main track, it also represents the eastern limits of interlocking protection. The interlocking machine is also arranged so that on light C of these signals the signalman can give a "calling-on" indication.

The weather was cloudy and a fog prevailed at the time of the accident, which occurred at about 4.45 a.m.

#### Description

Westbound freight train LR-1 consisted of 80 cars and a caboose, hauled by engine 3014, and was in charge of Conductor Freeman and Engineman Mooney. This train departed from South Lawrence, its initial station, 1.72 miles east of Shawsheen, at 4.30 a.m., 30 minutes late, and shortly after passing Shawsheen it collided with engines 3682 and 3637, coupled, while traveling at a speed estimated at about 8 miles per hour.

Eastbound light engines 3682 and 3637, coupled, and running as an extra train, were in charge of Engineman Kirkwood and Abbott. These engines departed from Worcester at 1.58 a.m., en route to Portland via Lowell and Lowell Junction. On arriving at Lowell Junction about 4.35 a.m. they passed around the east leg of the wye and out on the westbound main track, and then passed the crossover and continued eastward until they collided with train LR-1 while traveling at a speed estimated to have been about 25 miles per hour.

All three engines and the first four cars in train LR-1 were derailed, while the equipment involved was considerably damaged. The employees killed were the engineman and fireman of engine 3682, the lead engine, and the employees injured were the engineman, fireman and a flagman on engine 3637, and the engineman, fireman and brakeman of train LR-1.

#### Summary of evidence

Engineman Mooney, of train LR-1, stated that his train was moving at a speed of 7 or 8 miles per hour when the collision occurred. He was riding on his seatbox, observing signal indications as he passed them, but did not see the light engines approaching and did not know what had occurred until some time after the accident; the

last signal he passed before reaching the point of accident was displaying a clear indication. He attributed his failure to see these engines to the fog, which he said was more dense in some places than in others, and to the fact that he was operating the injector and watching the water glass, due to the fact that the fireman and head brakeman were engaged in cleaning out the elevators of the stoker. The statements of other employees on this train brought out nothing additional of importance.

Engineman Abbott, of engine 3637, stated that upon arrival at Lowell he held a conversation with the leading engineman and noticed nothing unusual about his actions, this was the last time he talked to him. While the engines were approaching the east end of the wye at Lowell Junction he observed that signal 31 was displaying a yellow, or calling-on, signal, which authorized the engines to enter onto the westbound main track but did not authorize them to pass westbound signal 40 against the current of traffic without flag protection or a train order. The engines continued beyond the latter signal without stopping, however, and as they had no train order and the movement was not being protected, he became apprehensive and inquired of the flagman, who was riding on his engine, as to whether they had authority to proceed and the flagman replied in the affirmative, and since he was also placing reliance on the leading engineman he therefore took no action to bring the engines to a stop. It also appeared from his statements that at certain points on the road, when they get a signal from a tower, they go regardless of the track being used, and after passing Lowell Junction he asked his fireman how long it had been the practice to operate trains between Lowell Junction and Lawrence without orders and the fireman replied that it had been done frequently and remarked that they probably were being run around some train on the eastbound track. Engineman Abbott admitted that he was equally responsible for the movement of the engines and could give no other reasons for his failure to ascertain definitely by what authority the movement was being made. He further stated that the last time he was examined on the book of rules was in February, 1918, although a new book of rules was issued in 1927, and that he had been in the instruction car only once during the past year.

Fireman Cheney, of engine 3637, stated that he was a qualified engineman but that he had never done any running. He was in a position to see all signals between Worcester and the point of accident and noticed that the lower light on signal 31 at Lowell Junction was displaying a yellow indication. The engines then entered on the west-

bound main track and continued eastward without stopping. He was aware they were running against the current of traffic and knew of no train orders granting this authority yet he did not call his engineman's attention to it, neither did he take any other action to stop the engines, and the only excuse he could offer for his failure to take some action was that he thought possibly they were running around some train on the eastbound main track. He also said he did not have any conversation with the engineman and that the engineman did not say anything to him about the movement, although he did notice the engineman conversing with the flagman. Fireman Cheney estimated the speed of the engines at the time of the accident at between 20 and 25 miles per hour.

Flagman French stated that he rode on the second engine the entire distance between Worcester and the point of accident and had no conversation with the crew of the leading engine after leaving the initial station. He knew they were moving on the westbound main track after passing Lowell Junction but thought they must have rights over it, although he had not seen any written authority to this effect. He could not recall whether Engineman Abbott made any inquiry concerning the movement against the current of traffic, neither did he remember telling the engineman that it was all right. He thought the speed of his train was not more than 20 miles per hour at the time of the accident.

Signalman Wing, on duty at Lowell Junction at the time of the accident, stated that he had been notified by the dispatcher that two light engines were approaching his station en route to Portland, but no train orders were issued for these engines to operate against the current of traffic. When the engines reached the track circuit on the Lowell Branch he lined the route for them to pass over the east leg of the wye and then inquired of South Lawrence engine house as to the status of train LR-1. Being of the opinion that he could cross the engines over to the eastbound main track before the arrival of that train, he displayed a yellow signal on light C at signal 51 before he attempted to line the crossover switches. Realizing his mistake he then decided to allow the engines to proceed on the westbound main track to a point beyond the interlocking limits, or as far as signal 40, clear of the circuit, after which he would give them a signal to back up and then have them make the crossover movement. After the circuit light in the tower went out, he heard the engines working steam, whereupon he picked up a lantern, left the tower, and ran towards the crossover in an effort to stop the engines but was unsuccessful. He then returned to the tower and notified the dispatcher as to what had occurred. Signalman Wing said that the general

practice is to line up the entire route before any signal indications are displayed but on the day of the accident he operated signal 31 before he discovered that he had not lined the crossover, and that he made no attempt to change the signal indication as he thought it would be better to make the movement in the manner described.

Dispatcher Crowley stated that at 4.39 a. m. the towerman at Lowell Junction informed him that he had let the light engines down the westbound main track. As train LR-1 had been reported by South Lawrence engine house tower, and as there was no open office between that point and Lowell Junction, there was nothing he could do to prevent the accident.

Signal Engineer Scott stated that lights A and B on signals 31 and 40 are semi-automatic, and that lights C are manually controlled from the tower. Light A on signal 31 is permanently set in the stop position and can not be changed by the towerman. Trains are not permitted to pass signal 31 unless a green or yellow light is displayed by lights B or C. With the east wye switch lined for the main track and the crossover switches set in normal position, which was the situation at the time the two light engines passed through the plant, a green light can not be displayed on light B, it only being possible for the towerman to give them the calling-on signal by means of light C, which would be a yellow light, and would authorize them to move eastward against the current of traffic only as far as signal 40.

Signal Maintainer Cowx stated that he was familiar with the interlocking plant at Lowell Junction. He arrived at that point about two hours after the occurrence of the accident and made an inspection and test of the plant and found everything in good condition. He said that while the weather was rather foggy at that time, he could see the indications displayed on signal 31 from the tower.

#### Conclusions

This accident was caused by extra 3682-3637 being operated against the current of traffic without authority and without protection, for which both engine crews and the flagman were responsible.

According to the evidence, when these engines approached Lowell Junction the towerman lined the route for them to move over the east leg of the wye and onto the westbound main track, but he unintentionally gave them a calling-on indication at signal 31 before he had lined

the crossover switches between the main tracks. This signal indication authorized the engines to enter the westbound main track and to proceed against the current of traffic on that track at slow speed prepared to stop, only as far as signal 40, which is at the eastern end of the interlocking plant. The surviving members of the crew knew they had no authority for continuing on that track, but the engineman said he was depending on the lead engineman and also that he was told by the flagman that they had authority for the movement, the fireman thought they might be running around some other train, and the flagman thought they must have rights over the westbound track, and the result was that they made no attempt to have the movement stopped, but continued eastward for a distance of approximately 4 miles to the point of accident. The reason the crew of the first engine failed to stop could not, of course, be determined.

In questioning some of the witnesses in connection with the rules, the following information was developed.

Engineman Abbott said he was promoted on February 1, 1918, and that he had not been examined on the book of rules since that time, although the current book of rules took effect on April 4, 1927, his statements clearly showed that he did not know what his rights were when making the movement against the current of traffic beyond the interlocking plant at Lowell Junction.

Fireman Cheney, who entered the service in January, 1918, and qualified as an engineman in January, 1927, said there was doubt in his mind as to his rights on the westbound track beyond the interlocking plant. In addition he was questioned concerning the movement made by the two light engines while en route between Worcester and Lowell Junction, in which they were operated against the current of traffic within the yard limits at Ayer, 24.72 miles from Lowell Junction, and when asked if he understood whether he could make such a movement, he said he did not know but that it had been done before. It also appeared from Fireman Cheney's statements that on one occasion he had been firing when a movement was made from Lowell Junction to Ayer against the current of traffic without train orders, but when pressed for further information on this point, he was unable to say when it was done.

Flagman French, who entered the service in August, 1918, but had not qualified as a conductor, was questioned by Superintendent Twombly, of the Portland Division, in part as follows.

Q. Although you have not taken any examination on the book of rules, you are familiar with the rules enough and your experience has been long enough so that you know you have no right to operate against traffic from Lowell Jct. to Ballardvale, Andover or Lawrence without orders.

A. Well I don't know, I felt absolutely sure that we were all right that morning.

Q. Why did you feel that you were all right?

A. I can't explain it unless I had the two points mixed up.

Q. Do you take interest enough in the job to keep yourself posted on special rules and time cards?

A. Yes.

Q. Do you know between what points trains are allowed to operate against traffic on the Portland Division main line?

A. Between ~~Wilmington~~ Jct. and Lowell Jct., at BT tower and between Alfred Road and Kennebunk.

Q. You think you can operate between Alfred Road and Kennebunk without train orders?

A. I think so.

Immediately following these statements, Mr. Pfeifer, assistant general manager, continued the questioning of Flaggman French, as follows.

That last statement you made to Mr. Twombly that you can make a reverse movement between Alfred Road and Kennebunk against traffic, you study up on your rules and pass an examination before Mr. Twombly before you go to work.

Q. Did you make any question to Mr. Abbott as to your right to be on the westbound main leaving Lowell Jct. to the effect that it must be all right to run any way around here?

A. No, sir.



Q. Do you know you cannot make a reverse movement between Lowell Jct., Andover, Ballardvale and Lawrence without a train order?

A. I was not sure, I felt he was all right.

Q. Is your time so taken up you cannot familiarize yourself, so that you do not know the rules?

A. No, sir. I read bulletins when they come out.

The situation as regards Engine an Abbott, who had last been examined on the book of rules at the time of his promotion in 1918, although a new book of rules was issued in 1927, is similar to that developed with the first accident investigation by this commission on the Boston and Maine Railroad, that which occurred at Hampstead, N. H., on October 9, 1911, and in the report covering the investigation of that accident, the following statement was made.

The Boston & Maine Railroad adopted standard rules June 21st, 1909, and at the time of their adoption a general circular was issued calling attention to a number of important changes from the rules then in effect. Conductors and engine-men promoted prior to this time were not examined as to the new rules, but all employees promoted since their adoption were required to pass a written examination. The conductor and engine-man at fault had been in service twenty and eighteen years, respectively. They had not been examined on the standard code rules now in effect, neither have any of the employees on this division been examined unless promoted after the adoption of the same. To insure safety it is obvious that the officials of the Boston & Maine Railroad should see to it that employees have a full and complete knowledge of the rules under which they operate.

The statements of the witnesses in the case of the accident here under investigation, as previously referred to in these conclusions, justify again a recommendation that the management of this road take prompt and adequate steps to insure that its employees are at all times properly instructed and examined on the rules under which they are operating, it is not believed that the requirements are fulfilled when employees are in the service for years without the benefit of periodical instruction and examination, possibly developing improper or indefinite understandings of various rules which were in effect when they

were examined, or which have become effective in subsequent years. It is true that instruction cars are operated from point to point over the system, thus affording an opportunity for employees to be orally instructed on the operating and air-brake rules, attendance is not mandatory, however, and it is doubted that such a system is sufficient for the purposes of safety in train operation.

All of the employees involved were experienced men, and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. Borland,

Director.