

Inv-2273

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE
BOSTON & MAINE RAILROAD

EAST SOMERVILLE, MASS.

MAY 31, 1938.

INVESTIGATION NO. 2273

SUMMARY

Inv-2273

Railroad: Boston & Maine
Date: May 31, 1938
Location: East Somerville, Mass.
Kind of accident: Head-end collision
Trains involved: Passenger : Freight
Train numbers: 114 : Extra 402
Engine numbers: 2415 : 402
Consist: 6 cars : 21 loads, 12 empties, caboose
Speed: 3 m.p.h. : standing
Operation: Yard track adjacent to interlocking.
Track: Four main tracks; compound left curve 30°43', 1,376 feet long.
Weather: Clear
Time: 6:50 a.m.
Casualties: 6 injured
Cause: Levermen failed to determine that route was properly lined for passenger train to proceed through interlocking, resulting in diversion of train to an occupied non-signalled yard track.

Inv-2273

June 25, 1938.

To the Commission:

On May 31, 1938, there was a head-end collision between a passenger train and a freight train on the Boston & Maine Railroad at East Somerville, Mass., which resulted in the injury of one employee and five passengers. This accident was investigated in conjunction with the Massachusetts Department of Public Utilities.

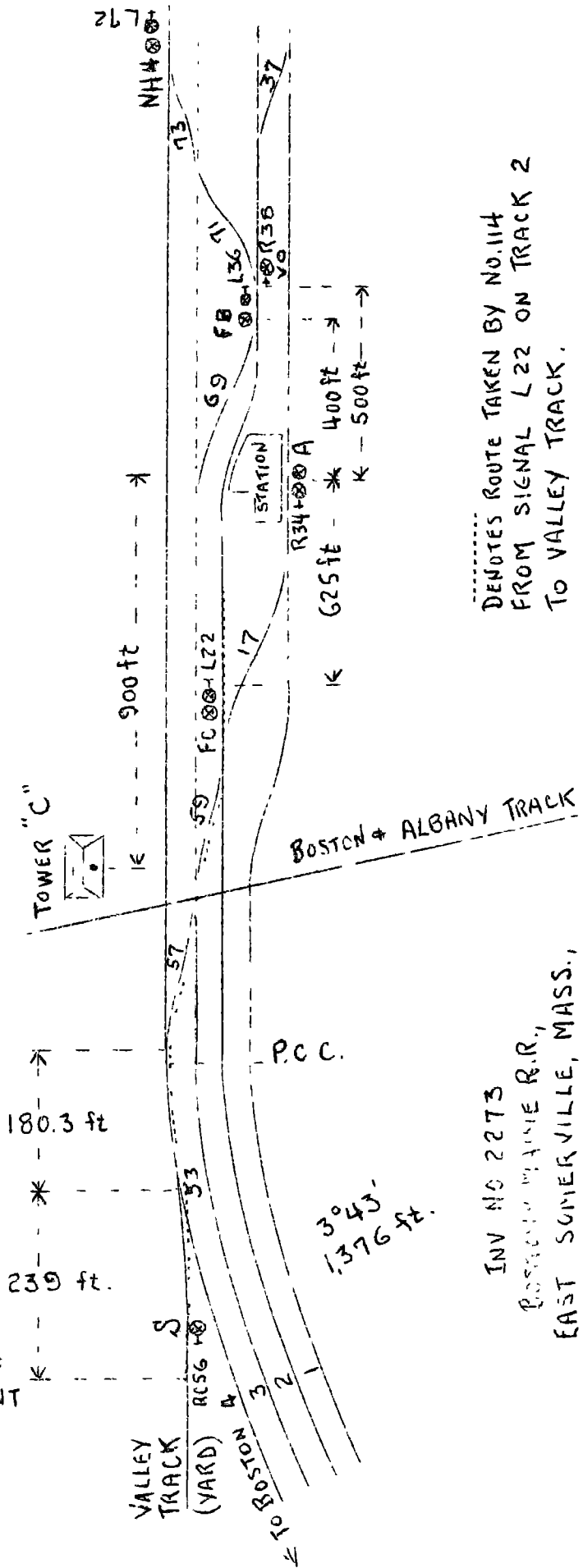
Location and method of operation

This accident occurred on that part of the Terminal Division, extending between Wilmington Junction and Boston, Mass., a distance of 17.92 miles. In the vicinity of the point of accident there are four main tracks, over which trains are operated by timetable rules and a signal-control system; from south to north these tracks are designated 1, 2, 3 and 4. Timetable directions are used in this report. The accident occurred on a yard track, known as the Valley Track, just outside of the west limits of the interlocking plant at East Somerville. Approaching from the east the main tracks are practically straight, followed by a compound curve to the left 1,376 feet in length, with a maximum curvature of $3^{\circ}43'$.

Westward from the interlocking plant at East Somerville there are four main tracks; tracks 1 and 2 extend through the plant and form the two main tracks of the East Route of the Terminal Division. Tracks 3 and 4 also extend through the plant and form two of four tracks constituting the West Route of the Terminal Division. The remaining two tracks of the West Route originate within the limits of the interlocking plant. At the west end of the plant a series of three continuous cross-overs provides west to east connection between the four tracks, and at the east end there is a similar series of continuous cross-overs providing west to east connection between the same four tracks; the switches farthest west in both these series of cross-overs are located on track 4. At the east end also a series of four continuous cross-overs starts at the track farthest north and provides east to west connection between the tracks at that end. The Valley track, which is a non-signalled yard track, enters track 4 from the west at the extreme west end of the plant through an interlocked switch, designated 53, which is governed by a signal,

- WILMINGTON JCT., MASS
5.38 mi
- READING HIGHLANDS
0.51 mi
- READING
10.55 mi
- EAST SOMERVILLE (P.O.F.A)
148 mi
- BOSTON, MASS

POINT OF
ACCIDENT



DENOTES ROUTE TAKEN BY NO. 114
FROM SIGNAL L22 ON TRACK 2
TO VALLEY TRACK.

INV NO 2273
BOSTON & ALBANY R.R.,
EAST SOMERVILLE, MASS.,
MAY 31, 1938.

identified as R56, located 140 feet farther west. Switch 53 is located about 180 feet west of the west/series of west to east cross-overs, and is on the left curve at a point about 175 feet from its eastern end. Tower "C", from which the plant is operated, is located north of the tracks at a point 375 feet east of Signal R56, East Somerville station is located within interlocking limits, between tracks 1 and 2, at a point approximately 900 feet east of Tower "C". Signal L22 is located about 625 feet west of the station; it governs westward movements on track 2, and through the west series of cross-overs. Signal R38 is located about 500 feet east of the station; it governs eastward movements on track 2 and also cross-over movements from track 2 to track 1. Cross-over 69 connects tracks 3 and 2 in the east series of west to east cross-overs; its east switch is located about 400 feet east of the station. Train movements are made under authority of a tower director and two levermen.

The interlocking machine is of the electro-pneumatic type, consisting of 33 levers for 49 switches and 2 derails; 28 levers for 14 two-light and 47 one-light dwarf signals; 1 lever for 1 three-arm home signal; 2 levers for route selections. The machine is equipped with mechanical and electric locking. Switches are protected by detector and route locking. A model board over the machine shows the track layout and indicates whether or not tracks are occupied. Machine levers are equipped with lights to indicate when a train is occupying a circuit over switches. The main tracks are signalled for reverse running, and train movements are made by signal indications. Signals are of the 2-unit, dwarf color-light type on main line, and 1-unit dwarfs for movements from yards, etc. All track is circuited within the confines of the interlocking, and standard approach, indication and route locking are provided. Of the aspects capable of display by main track signals, red-over-red indicates, "Stop", and red-over-yellow indicates, "Proceed through the cross-overs not exceeding slow speed, prepared to stop at next signal". Slow speed, in accordance with the above, is a speed not exceeding 15 miles per hour.

The weather was clear at the time of the accident, which occurred about 6:50 a.m.

Description

No. 114, a west-bound passenger train, consisted of five coaches and one combination car, all of steel-underframe construction hauled by engine 2415, and was in charge of Conductor Woods and Engineman Nute. This train left Reading at 6:23 a.m., on time, and on arrival at East Somerville, 10.55 miles distant, it was diverted from track 4 to track 2 through the interlocking

in order to make the station stop. It departed on track 2 at 6:49 a.m., on time, passed signal L22, which was displaying a red-over-yellow indication, proceeded through the cross-overs to track 4 at a speed of from 6 to 12 miles per hour, and continued on track 4 a distance of 180.3 feet to switch 53, where it was diverted into the Valley Track. After moving on this latter track for a distance of 239 feet it struck Extra 402 while traveling at a speed of about 2 or 3 miles per hour.

Extra 402, a local freight, consisted of 21 loaded cars, 12 empties and a caboose, hauled by switch engine 402, headed west and backing up, and was in charge of Yard Foreman Kenyon and Engineman Reed. This train, which was destined for the East Route, stood on the Valley Track, just outside interlocking limits, at a point 107 feet west of signal R56, waiting for the signal to cross over to track 1, when the rear end of its tender was struck by No. 114.

Both engines and three cars in No. 114 were damaged. None of the equipment in either train was derailed. The employee injured was a passenger trainman.

Summary of evidence

Train Director Lowery stated that he supervises two levermen, one of whom operates the switches at the east end of the plant, and the other the switches at the west end of the plant. Usually he directs all movements verbally by means of a code, but levermen are permitted to make movements on their own initiative. East-bound train No. 207, and west-bound train No. 114 are due at the plant at the same time, 6:49 a.m. No. 207 pulls into East Somerville station on track 1, and No. 114, which arrives at the entrance of the plant on track 4, is diverted to track 2 to do its station work. On the morning of the accident Extra 402 was reported as ready on the Valley track at about the same time as the two passenger trains were due. As No. 114 approached the plant the director ordered that the route on track 2 for that train be set only to signal L22 which protected the west set of cross-overs, this for the purpose of permitting light engine movements through the plant during the time No. 114 was at the station, if desired. When No. 114 arrived at the station the Director gave the order "S to VO" which was a code instruction to move Extra 402 from the Valley Track to switch 38; he intended that the move be made through the west cross-over from the yard lead to track 3, over track 3 to the east series of eastward crossover switches, thence on to track 2 through crossover 69 to a point east of the rear end of No. 114, and eastward on track 2 to signal R38 which controlled movements from track 2 to track 1. The movement of Extra 402 from track 2 to track 1 was to be made after No. 207 had departed.

Leverman Mitchell evidently started to line the switches in accordance with the order but discovered that cross-over 69 in the east series could not be operated, and he so reported to the director who then said "After this train goes we will move him the other way," meaning that Extra 402 would be moved from the Valley track to track 1 through the west series of cross-overs after No. 114 had departed. After No. 114 left the station he noticed that it was headed toward track 4 although he had intended that it should move to North Station on track 2 and he had given no orders to the contrary. At that time the engine of No. 114 was almost on track 4 and it was too late for him to take any action to stop it. Had he noticed the wrong move earlier he could have signalled No. 114 to stop by blowing a whistle.

Leverman Mitchell stated that while operating his machine his back is to the main track. When the tower director called "S to VO" he assumed that No. 114 had departed and that track 2 was clear, and he set up the route from the Valley track to track 2 via the west series of cross-overs; this is the shortest route for the movement intended. He tried to clear signal R56 for Extra 402, but was unable to do so, and then noticed that cross-over 69 light was out. He reported to the director that 69 would not light up, and the director gave orders to "wait until this train goes and put them across the other way". Leverman Mitchell understood that No. 207 on track 1 was meant by the Director, and the "other way" mentioned would be over the cross-over route which he had already lined up plus the additional cross-over from track 2 to track 1. There are three routes which can be set up to meet the "S to VO" code order and, no doubt, the route which he had set up was not the one the director had in mind. When Leverman Stevens released signal L22, to permit No. 114 to leave the station, he did not know that the route was lined into the Valley track.

Leverman Stevens stated that as No. 114 approached signal L22 after leaving East Somerville station, that signal was displaying a red-over-red indication. On his/own initiative he changed the indication to red-over-yellow, assuming that the route was lined for track 2. He had heard the order "S to VO" given by the director for the routing of Extra 402 and he understood that since No. 114 was standing on track 2 the crossover movement from track 3 to track 1 would be made through the east series of cross-overs. He had heard Leverman Mitchell report that he could not get 69 cross-over, and he also heard the director instruct Leverman Mitchell to change the route and put them around the other way. Leverman Stevens understood the director's order to mean that after No. 114 had departed Extra 402 was to be routed from the Valley track to track 1 by the way of the west series of cross-overs. Leverman Stevens did not make a close examination of his machine before clearing signal L22.

Engineman Nute, of No. 114, stated that the air brakes were tested at Reading Highlands, their initial station, and worked properly in making various stops en route. His train departed from East Somerville station on track 2 at 6:49 a.m., at which time signal L22 was displaying red-over-red, but before reaching that signal the indication changed to red-over-yellow. Since it is permissible to move trains over tracks 1, 2, 3 or 4 between Tower "C" and North Station he assumed that his train was being diverted to track 4 for the trip to North Station so he proceeded through the cross-overs at about 8 or 9 miles per hour. He was on the outside of the curve and as he was unable to see the route beyond the cross-overs from track 2 to track 4, he was unaware of anything wrong until the fireman shouted a warning of danger; at that time the engine was near switch 53 and the speed about 9 or 10 miles per hour. He immediately applied the air brakes in emergency and the speed was reduced to about 2 or 3 miles per hour when the collision occurred.

The statement of Fireman Lydstone, of No. 114, agreed with that of Engineman Nute. In addition, he stated that because of the curvature through the cross-overs and around track 4 it is difficult to see the position of switch 53, and his engine had already started to enter the Valley track, when he saw the fireman of freight Extra 402 giving stop signals. He immediately called a warning to his engineman; at that time the speed was about 10 or 12 miles per hour, but it was reduced to about 3 miles per hour at the time of the accident. Usually train No. 114 is routed over track 2 from East Somerville to North Station, Boston, but occasionally this movement is made over some other track.

Conductor Woods and Trainmen Perley and Boyce were in the cars and were not aware of anything wrong until the air brakes were applied in emergency. They estimated the speed at that time to have been between 6 and 10 miles per hour.

Fireman Merrill of Extra 402, stated that his train was on the Valley track, with the engine headed west, and was standing about two car lengths west of signal R56, which was displaying a stop indication. He saw that switch 53 was open, and thought that it was intended to run No. 114 from East Somerville to Boston on track 2. When he saw No. 114 cross over from track 2 to track 3 he was uncertain as to what route it would take, but when he saw it cross over from track 3 to track 4, moving at a speed of 10 to 12 miles per hour, he left his engine and ran toward the approaching train waving stop signals. The brakes on No. 114 were applied just as the engine entered the Valley track switch.

Engineman Reed, and Brakeman Cameron of Extra 402 corroborated the statement made by Fireman Merrill.

Discussion

When No. 114 from the Western Route approached the interlocking plant, the tower director gave instructions to permit it to move from track 4 to signal L22 on track 2; this was done to keep the west series of cross-overs available for light engine movements while the passenger train was doing station-work. Both No. 114 and No. 207 and east-bound train destined for the East Route, are due at East Somerville at 6:49 a.m. As these two trains approached, Extra 402 reported ready to depart from the Valley track. After No. 114 had reached the station it was possible to move Extra 402 from the Valley track via track 3 and cross-over 69 to signal R38 where it would be in position to move to track 1 when No. 207 had gone. Accordingly the director called the order "S to VO" which is code instruction for a movement from the Valley track to signal R38. However, this movement can be made over three routes, the most direct of which is via track 2 past the station platform. The leverman who was to execute the order was under the impression that No. 114 had passed out of the plant and that track 2 was clear, hence he lined the route via that track, but after doing so he was unable to clear signal R56 which would permit Extra 402 to move. In seeking the cause of his inability to clear signal R56 he discovered that the indication for cross-over 69 was dark and he so reported to the director who said to "wait until this train goes and put them across the other way". The leverman thought that the director meant by "this train" No. 207, whereas the director actually meant No. 114; to the leverman "the other way" meant the route he had already lined plus the cross-over from track 2 to track 1. The second leverman knew that No. 114 had not gone, and he interpreted the order "S to VO" in the manner intended by the director, therefore he did not know that the west series of cross-overs had been lined from the Valley track to track 2, and when No. 114 started from the station he cleared signal L22 on his own initiative without first checking his machine indications. As a result, No. 114 headed in upon the Valley track, beyond the limits of the interlocking, which was occupied by Extra 402. When the towermen realized the misunderstanding that had occurred between them it was too late to take action to avert the accident.

Since the occurrence of this accident, the following bulletin order has been issued.

Boston, June 1939

To All Concerned:-

Your attention is called to the paragraph on Page 87 of Time Table 25 which refers to Rule 601, and is titled "Change of Indication

and New Signal Aspects", with particular reference to that part titled "Color Light Dwarf Interlocking Signals."

Signal - Dark over Yellow - Indication - ~~Proceed at Restricted Speed - Name - "Restricting"~~. This signal is now in use in territory controlled by Tower C, and is the proper signal for a movement through the interlocking, and into unsignalled territory. Enginemen receiving this signal will understand that the route is lined to put them into a yard track, and that they must see and know that track to be clear beyond the limit of the interlocking.

Trains intended to move through the interlocking, and to continue on main tracks should not receive this signal. Enginemen of such trains receiving this signal must know where they are heading, and stop unless they know why they are being lined out of main line territory.

Conclusion

This accident was caused by levermen failing definitely to ascertain that the route was properly lined before clearing signal L22 for passenger train No. 114 to proceed through the interlocking, resulting in the diversion of this train to an occupied non-signalled yard track.

Respectfully submitted,

W. J. PATTERSON

Director.