

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD
AT ATLANTIC, MASS., ON NOVEMBER 29, 1933.

February 14, 1934.

To the Commission:

On November 29, 1933, there was a rear-end collision between two passenger trains on the New York, New Haven & Hartford Railroad at Atlantic, Mass., which resulted in the death of 1 employee, and the injury of 204 passengers and 3 employees. 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 Boston Division extending between Braintree and Boston, Mass., a distance of 10.14 miles; in the immediate vicinity of the point of accident this is a four-track line over which trains are operated by time table, train orders, and an automatic block-signal system. The tracks are numbered from west to east, 3, 1, 2, and 4; the accident occurred within interlocking limits on track 2 at a point approximately 514 feet north of the center line of the station at Atlantic, or 55 feet north of signal 38L. Approaching this point from the south, there is a 3° curve to the right 733 feet in length, 609 feet of tangent, a 3° curve to the left 733 feet in length, and then the track is tangent a distance of about 1,100 feet to drawbridge 509, over the Neponset River, and for some distance beyond; the accident occurred on the last-mentioned curve at a point about 375 feet from its southern end. The grade is practically level.

Between Braintree and Atlantic, a distance of 4.65 miles, the railroad is a double-track line, and from Atlantic to Boston, a distance of 5.49 miles, within which territory the accident occurred, it is a four-track line. The diverging switch from the two-track to the four-track line for north-bound movements is located about 415 feet south of the station at Atlantic, under the overhead bridge at Hancock Street, and route signal 30L is located 225 feet south of this switch.

Interlocking station U-436 is located in the bridge cabin on drawbridge 509; the interlocking is an electric plant with 36 working levers and 5 spare levers. The signals involved in the accident, named in order from drawbridge 509 southward, are

Interlocking Station U-436

Drawbridge No. 509

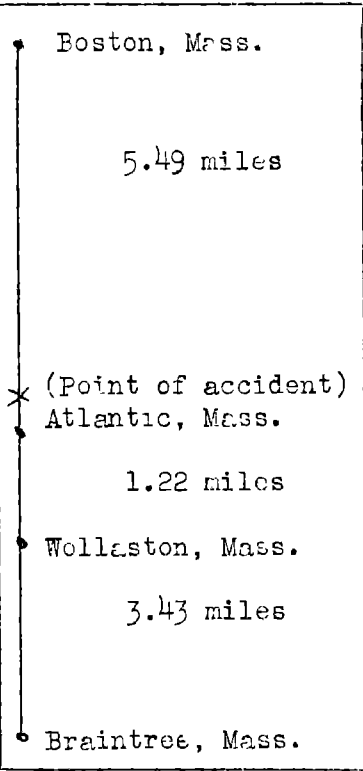
NEPONSET RIVER

Signal 36L

1,100 ft.

Track No.	3
"	1
"	2
"	4

P.T.



Point of accident

Signal 38L

514 ft.

Station

Location of flagman

P.C.

Hancock St.

1,090 ft.

Beginning of track 4.

Overhead bridge

609 ft.

P.T.

Route Signal 30L

To Sig. 0-6.4, 4,690 ft.

To Sig. 0-6.0, 1,990 ft.

733 ft.

Inv. No. 1369

New York, New Haven & Hartford

Atlantic, Mass.

Nov. 29, 1933.

as follows: drawbridge home signal 36L, home signal 38L, route signal 30L, semiautomatic signal 0-6.0, and automatic signal 0-6.4. These signals are located approximately 235 feet, 1,295 feet, 2,385 feet, 4,375 feet, and 7,075 feet, respectively, south of drawbridge 509. Signals 36L and 38L are mounted on bracket posts. When route signal 30L displays a proceed indication it not only indicates that the approaching train is to use track 2 but it also means that that track is unoccupied as far as home signal 38L. The indications displayed are green, for proceed; yellow over green for approach-restricting, requiring that trains approach next signal at restricted speed; yellow over red for approach, requiring that trains reduce speed at once and proceed at restricted speed, not exceeding 25 miles an hour, prepared to stop at the next signal; and red, for stop. In this instance the first train stood on track 2 at drawbridge signal 36L, with its rear end just north of signal 38L, and the following signal indications should have been displayed for the second train; signal 0-6.4, approach-restricting; signal 0-6.0, approach; route signal 30L, proceed; and signal 38L, stop.

No closed time to navigation is permitted at the Neponset River drawbridge in order to give preference to rail traffic during rush hours, it being required that when a vessel blows for the draw it must be opened.

The weather was clear at the time of the accident, which occurred about 8:24 a.m.

Description

North-bound passenger Train No. 642 consisted of eight coaches, all of steel-underframe construction and equipped with anti-telescoping steel vestibules, hauled by engine 1361, and was in charge of Conductor Robinson and Engineman Thayer. This train left Braintree at 8:09 a.m., 1 minute late, and stopped at signal 36L, which was displaying a stop indication on account of the draw span being open. After the train had been standing at this point about 5 minutes the draw span was closed and the engineman sounded the whistle signal calling in the flagman, but while the flagman was still out the rear end of the train was struck by Train No. 646.

North-bound passenger Train No. 646 consisted of nine coaches, all of steel construction, hauled by engine 1345, and was in charge of Conductor Russell and Engineman Sylvia. This train left Braintree at 8:10 a.m., on time and only 1 minute behind Train No. 642, and made several stops en route. It left Wollaston, 1.22 miles south of Atlantic, about 8:20 a.m., still 1 minute late, passed signal 0-6.4, which was displaying an approach-restricting indication, passed signal 0-6.0, which was displaying an approach indication, passed route signal 30L at

the beginning of the four-track line, which signal was displaying a proceed indication with the route lined for track 2, passed the flagman of Train No. 642 who was at a point in the immediate vicinity of the south end of the station at Atlantic, passed signal 38L, which was displaying a stop indication, and then collided with Train No. 642. The speed at the time the brakes were applied in emergency just before the collision occurred was variously estimated to have been between 25 and 45 miles per hour.

The rear end of the rear car of Train No. 642 was crushed in for a distance of several feet, while minor damage was sustained by all other cars in this train. The front end of engine 1345 was damaged, while the platform of the first car in its train overrode the frame of the tender, bending in the front end of the car and the rear end of the tender and shoving the cistern forward into the cab of the engine, badly damaging the cab; the second car in the train was slightly damaged. The employee killed was the fireman of Train No. 646, while the employees injured were the engineman, conductor and ticket collector of that train.

Summary of evidence

Engineman Thayer, of Train No. 642, stated that he whistled out a flag as he brought his train to a stop at signal 36L at 8:19 a.m. When the draw span closed and signal 36L had cleared for his train, about 8:24 a.m., he whistled in the flagman and released the brakes, the collision occurring about 15 or 18 seconds later. Fireman Brooks saw the flagman going back and on looking back from his side of the cab after the flagman had been recalled he saw Train No. 646 approaching; he estimated its speed to have been about 30 miles per hour when it was about 8 or 10 car lengths from the rear end of his own train and he said that the impact moved his train ahead about 20 or 25 feet.

Conductor Robinson, of Train No. 642, said that he was collecting fares in the third head car when his train stopped, and after completing his work in that car he saw the flagman quite a ways back, going out to flag; he estimated that his train had been standing between 1 and 3 minutes when it was struck and did not think his flagman had time to get back more than 200 feet. Ticket Collector Davis saw the flagman going back after the train stopped.

Baggagemaster Senate, of Train No. 642, had finished collecting tickets in the first car when the train stopped and he said he immediately started back through the train to take the place of the flagman at the rear end, counting the passengers as he went. After reaching the rear end he heard his engineman call in the flagman and then looked back and saw him flagging the approaching train. Baggagemaster Senate fixed the location of the flagman as being at the gate in the inter-track fence or

about at the south end of the station building, and said that the engine of Train No. 64C was working steam when it passed under Hancock Street bridge and also when passing the flagman, and he estimated that it was traveling at a speed of 35 miles per hour.

Flagman Alden, of Train No. 642, was closing the trap doors at the head end of the third rear car as his train was stopping for signal 36L; he dropped off but his train stopped before the last car passed him and he had to walk the length of that car in order to get his flagging equipment from behind the last seat in the car, saying that he had started back before he heard the engineman whistle him out. After procuring his flagging equipment he saw that signal 38L was displaying a stop indication and proceeded back to flag, reaching a point just south of the center of the station at Atlantic before he saw Train No. 646 approaching 1,500 or 2,000 feet distant, and began giving stop signals. His signals were not answered, and then he looked ahead and saw that signal 38L still was displaying a stop indication; he estimated the speed of Train No. 646 when the engine passed him, working steam, to have been about 40 or 45 miles per hour, and said that he also threw an unlighted fusee at the cab window, but it missed. Flagman Alden, who was on the engineman's side did not observe any one on the engine at any time as it approached and passed him, but he did notice the air brakes applying on the train when the engine was in the vicinity of signal 38L.

Engineman Sylvania, of Train No. 646, who was not interviewed at the hospital until December 20, said signal O-6.4 was displaying an approach-restricting indication and that signal O-6.0 was displaying an approach indication, requiring that his train should not exceed a speed of more than 25 miles per hour. Route signal 30L was displaying a clear indication, meaning that the route was lined for track 2 and that the way was clear as far as signal 38L. On account of the curve to the left when approaching the station at Atlantic, the engineman said it was necessary to depend on the fireman to call the indication displayed by signal 38L; in this particular case he said the fireman, standing on the deck with his head out of the window, called "all right" at the usual place, about the time the engine passed under the bridge at Hancock Street. When the engine got around the curve to a point where the engineman could see the signal himself, or when about opposite the station, he observed that it was displaying a stop indication and immediately applied the air brakes in emergency and opened the sanders, but it was then too late to avert the accident. Engineman Sylvania thought his speed was about 25 miles per hour when he saw the signal and was of the opinion that he could have stopped within another car length; he did not see the flagman.

Conductor Russell, Flagman Hunt, Baggage-master Rae, and Ticket Collectors Bradford and Frawley, of Train No. 646, said the air brakes were applied in emergency just before the accident occurred, their estimates being that they were applied from a few seconds to 20 seconds before the collision; their estimates of the speed at that time ranged from 30 to 45 miles per hour. Baggage-master Rae, who was riding in the first car, said that the air brakes were applied in emergency when his car was almost opposite the station.

Operator Thomas, at interlocking station U-436, stated that he opened the draw span about 8:15 a.m. to permit a tug boat and schooner to pass, that Train No. 642 arrived at 8:19 a.m. and stopped at signal 36L, and that he thought the draw span was closed and signal 36L cleared about 8:22 a.m., but Train No. 642 did not start, as the engineman whistled in the flagman and was waiting for him to return.

Assistant Signal Maintainer Moseley said he was just south of the overhead bridge at Hancock Street on the fireman's side of the track when Train No. 646 passed him; at that time the speed of the train was about 40 miles per hour, with the engine working steam, and he could see the fireman apparently working on the fire. Maintainer Moseley also saw the flagman of Train No. 642 about opposite the station ticket office, which point is very close to where the baggage-master of Train No. 642 placed the flagman when the latter was giving stop signals to Train No. 646. Maintainer Moseley heard the sound of the collision and went to the scene immediately, and at that time he saw signal 33L in the stop position.

Signal Supervisor Frantzen reached the scene of the accident about 20 minutes after its occurrence and found all signals displaying the proper indications at that time. Examination was then made of the signal system, including all circuits, track and signal relays, interlocking, etc., but nothing wrong was found nor were any repairs made. The statements of the engine crew of Train No. 648, scheduled to leave Braintree 7 minutes behind Train No. 646, were to the effect that all signals were displaying the proper indications when they closed in on Train No. 646 at the scene of the accident.

Conclusions

This accident was caused by the failure of Engineman Sylvia of Train No. 646, properly to obey signal indications and the stop signals of a flagman.

Engineman Sylvia was on his regular run and was thoroughly familiar with conditions in the vicinity; he fully understood the meaning of the approach-restricting indication of signal O-6.4 at the beginning of interlocking limits and the approach indication of signal O-6.0, which latter indication required

him to operate his train at restricted speed, not in excess of 25 miles per hour, prepared to stop at the next signal. Engineman Sylvia said his fireman called the next signal as being clear, that he did not see a flagman, and that his first knowledge of anything wrong was when the signal came within his range of vision when he passed the station, not more than 450 feet from the signal; he also said his speed at that time was 25 miles per hour and that he thought he could have stopped within another car length. The statements of all five members of his train crew, however, as well as the assistant signal maintainer, all of these employees being men of long experience, were to the effect that the speed was from 30 to 45 miles per hour when the brakes were applied and it is believed these higher estimates are more nearly correct; all the cars in Train No. 646 were equipped with PC brake equipment, capable of producing 180 percent braking power from an emergency application, and at a speed of only 25 miles per hour an emergency application of these brakes, which had been tested and had worked properly en route, if made at the point where the engineman could see signal 38L, should have stopped the train short of the point of accident, in spite of the fact that the train was heavily loaded. There is also corroborative evidence that Engineman Sylvia ran past a flagman; the fireman, conductor and ticket collector on Train No. 642 saw him go out, while the baggagemaster went to the rear end to take the flagman's place and saw him flagging Train No. 646 and also saw the latter train pass him at a speed the baggagemaster estimated to have been about 35 miles per hour, working steam; the assistant signal maintainer south of the bridge also saw the flagman approximately where the baggagemaster said he was located. There is no way of verifying Engineman Sylvia's statement that his fireman miscalled the indication displayed by home signal 38L, but the fact remains that had he been operating his train in this congested territory at a speed permissible under the two restrictive signal indications he had received, and had he also seen and obeyed the stop signals of the flagman, he could have stopped in time to avoid the accident.

During rush hours trains are operated between Braintree and Boston under very close headway, as in the case of the two trains here involved which are scheduled to leave Braintree only 2 minutes apart and actually departed 1 minute apart, and in order to so operate in safety it is essential that employees be on the alert at all times and strictly comply with the rules. When Train No. 642 was coming to a stop at signal 36L, Flagman Alden was at the head end of the third rear car closing trap doors; he dropped off while the train was still moving, boarded the rear car and procured his flagging equipment, and then started back to flag. The evidence indicates that his train stood at signal 36L about 5 minutes before the accident occurred, but within this time the flagman went back only a distance of

approximately 550 feet. Under the rules the flagman is required to go back immediately with stop signals a sufficient distance to insure full protection; regardless of the delay Flagman Alden encountered before actually leaving the rear of his train it would appear that there was ample time for him to have gone back to the overhead bridge, and had he done so it is probable he would have been seen by the engine crew of Train No. 646 in time to avoid the accident. These two trains were carrying nearly 1,300 passengers; in the interest of safety, with crowded trains of this character operated under very close headway, the flagman should be stationed in the last car at all times, so that he may be in constant readiness to afford proper rear-end protection whenever required under the rules.

The integrity of the signal system is not involved, for not only did subsequent examination and test show it to be in proper working order but the statements of Engineman Sylvia showed that all signals were displaying the proper indications for the movement of his train.

All passenger cars on this railroad are of steel construction with the exception of 25 steel-underframe cars, 8 of which composed Train No. 642. These cars are equipped with anti-telescoping steel vestibules and although they were occupied by 515 passengers there were very few who were seriously injured and none was killed. This was in marked contrast with the results of the accident on the Erie Railroad at Binghamton, N.Y., on September 5, 1933, wherein a standing train was struck by another train which probably was not moving at any higher rate of speed at the moment of impact than in the present case. In the Erie case the standing train consisted of eight cars, the sixth and eighth being of steel-underframe construction while the seventh was of steel construction, and the front end of the seventh car telescoped the rear of the sixth car a distance of 47 feet, resulting in the death of 14 passengers and the injury of many others. There was one important difference in the construction of the steel-underframe cars on the two roads, however, namely, that the Erie steel-underframe cars did not have anti-telescoping steel vestibules with which the New Haven cars were equipped. Had these cars not been well built and equipped with substantial end construction, it is probable that the casualties among the passengers would have been much more serious than actually was the case.

Respectfully submitted,

W. P. BORLAND

Director.