

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE
NEW YORK, NEW HAVEN & HARTFORD RAILROAD AT NORWOOD
JUNCTION, MASS., ON MARCH 17, 1921.

April 7, 1921.

On March 17, 1921, there was a head-end collision between a work train and a freight train on the New York, New Haven & Hartford Railroad at Norwood Junction, Mass., which resulted in the death of 4 employees and the injury of 13 employees. The investigation of this accident was conducted in connection with representatives of the Massachusetts Department of Public Utilities, and as a result of this investigation the Chief of the Bureau of Safety reports as follows:

Location.

This accident occurred on that part of the Midland Division extending between Franklin and Boston, Mass., a distance of 27.12 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 automatic signals are banner signals of the clock-work type with revolving targets, except at Norwood Junction, where the first automatic signal in each direction is of the 2-position, lower-quadrant, semaphore type. Approaching Norwood Junction from the west the following signals are encountered: automatic banner signal 38; semi-automatic distant semaphore signal 1; semi-automatic interlocking home signal 10, the normal indication of which is stop; and automatic 2-position semaphore signal E-198.4; these signals are located 4,773 and 3,282 feet west, and 207 and 720 feet east, respectively, of the point of accident. Signal 38 governs to signal 10; signal 1 displays a distant indication for signals 10 and E-198.4 and can not be cleared with either of these signals displaying a stop indication; signal 10 governs to automatic signal E-198.4. Day and night indications are red, yellow and green, for stop, caution and proceed, respectively.

The accident occurred on the track circuits controlling signals 38 and 1, at a point 207 feet west of signal 10 and about 100 feet east of the interlock tower, which is known as signal station 233 and is located on the south side of the main tracks. Approaching this point from the west there is a long 30-minute curve to the right, followed by about 900 feet of tangent and a curve of $3^{\circ} 20'$ to the left, extending beyond the point of accident, a distance of 1,047 feet. There is a long descending grade and 900 feet of level track, followed by 800 feet of .32 per cent and 700 feet of .89 per cent ascending grade to the point of accident. The weather at the time of the accident was clear.

Description

Work extra 960 consisted of 2 box cars, 1 work car and a caboose, hauled by locomotive 960, and was in charge of Conductor Spicer and Engineman Joyce. At Franklin, the initial terminal, the crew received a copy of train order No. 14, form 19, reading as follows:

on
"eng 960 works/eastward and westward tracks
seven ten 7.10 a.m. to twelve 12 noon between
Franklin and Norwood Central."

Norwood Central is .24 mile east of Norwood Junction. Work extra 960 left Franklin at 9.13 a.m., backing east on the eastbound track, it being the intention to cross over to the westbound track at a crossover located approximately 1,500 feet east of Norwood Central Station, leaving a flagman in the vicinity of signal E-198.4 to protect against eastbound trains. Signal E-198.4 was found to be displaying a stop indication and there was also a flagman near it who was protecting a westbound extra which was doing some switching. Work extra 960 was brought to a stop, after passing the tower at 10.02 a.m., with the west end of the caboose about opposite signal 10, which had been cleared by the towerman for the passage of the work extra. The insulated joints for signal 10 are 17 and 38 feet east of the signal, and the east end of the caboose of work extra 960 was east of the first of these joints and therefore caused signal 10 automatically to display a stop indication. The conductor then decided to use the crossover, the west switch of which is 651 feet east of the tower, and gave a signal to the engineman to move ahead, or westward, as the caboose was fouling the interlocking circuits, so that the towerman could operate the crossover switches and display signals for the crossover movement. The train moved westward a distance of 60 to 80 feet, the indication of signal 10 then automatically changed to clear, and the conductor was about to notify the towerman of the movement he wished to make when the train was struck by extra 404. Work extra 960 had just started to move eastward at the time of the accident.

Eastbound freight train extra 404 was a symbol train which operates from Fitchburg to Boston; it consisted of 24 cars and a caboose, hauled by locomotive 404, and was in charge of Conductor Corcoran and Engineman Rhodes. It left Walpole, 4.06 miles from Norwood Junction, at 9.53 a.m., and at 10.05 a.m. collided with work extra 960 at Norwood Junction while traveling at a speed estimated to have been about 20 miles an hour.

The front ends of both engines were considerably damaged; slight damage was sustained by three cars. The em-

ployees killed were the fireman of extra 404 and three laborers riding in a car of ties in the work extra.

Summary of evidence.

Head Brakeman Titus had ridden on the pilot of locomotive 960 between Walpole and Norwood Junction and he said that when the work extra made its first stop, east of the tower, he got off and started west to protect by flag and had gone about 4 or 5 car-lengths when extra 404 passed him at a speed of about 25 miles an hour. He did not notice that the brakes had been applied and had not heard any acknowledgment given of his stop signals. Engineman Joyce thought the flagman was 3 or 4 car-lengths west of the tower when the work extra stopped; Fireman Sweeney thought the flagman was about at the tower, while Conductor Spicer said he saw him about a car-length west of the locomotive before he gave Engineman Joyce the signal to move westward off the track circuits.

Engineman Rhodes, of extra 404, said signal 38 was displaying a stop indication when he first saw it, that he applied the air brakes and reduced the speed of the train and that the signal changed to clear when the locomotive was within about 25 feet of the post marking the beginning of the block section; after the locomotive passed this post the indication of this signal changed from clear to stop, indicating that it was operating properly. Engineman Rhodes said his train had nearly stopped and that he then worked steam for a distance of 400 or 500 feet; he saw the caution indication of signal 1, and after the fireman and the two brakemen who were riding on the locomotive said that the signal was clear, meaning signal 10, he again began to work steam. He said the first warning he received of approaching danger was the waving of two red flags from a window in the tower, at which time he was within 3 car-lengths of the tower; he did not see anything of a flagman. Engineman Rhodes further stated that there was a man at signal 38 and that he gave an "All right" motion with his hand. The statements of Brakemen Chute and Hill, who were on locomotive 404, indicated that signal 38 changed from stop to proceed when the locomotive was about 10 car-lengths from it, that a caution indication was received at signal 1, and that the engineman allowed the train to drift until they told him the home signal was clear. Brakeman Chute thought the train was within 6 or 7 car-lengths of the tower when he saw the flagman of the work extra, just west of the tower and not more than 3 car-lengths from his train, and he said that when they saw this flagman they called to the engineman, who immediately shut off steam; Brakeman Chute said the engineman applied the air brakes; Brakeman Hill said he did not have time to do so, and he thought the flagman was east of the tower. Brakeman Hill further stated that after the

indication of signal 38 changed to clear Engineman Rhodes made the remark that the signalmen who were working at the signal must have had it connected up so that it displayed a stop indication and that when they saw his train approaching they changed the connection. Conductor Corcoran said he noticed an application of the air brakes approaching signal 38. Flagman Kearn, who was riding in the cupola of the caboose, noticed an application of the brakes as the train approached signal 38; he did not notice its indication, neither did he see any one working in its vicinity. Flagman Kearns saw signal 1 displaying a caution indication and signal 10 displaying a clear indication, but did not see the flagman of the work extra.

Signal Maintainer Delaney and Signal Helper Feeney were working on some insulated joints and signal relays on the westbound track at points 1,400 and 1,450 feet, respectively, west of signal 38, while Trackwalker DiCarlo was working on the track at a point about 50 feet east of the signal. The statements of all of these employees indicated that signal 38 was displaying a stop indication when extra 404 approached at a speed of about 25 miles an hour and that its indication at no time changed from stop to proceed.

After work extra 960 had passed the tower and he had seen signal 10 go to stop, Towerman Butler left the tower for a few moments and when he returned, just before the accident occurred, he saw signal 10 displaying a clear indication, with the work extra a short distance west of the signal. At about this time the flagman of the work extra was at the east end of the tower and he told the flagman that there was a train coming, having heard its whistle. The clear indication of signal 10 was its proper indication after work extra 960 had moved off the circuits, Towerman Butler saying that he had not changed the position of the levers or operated the screw release, these being the only methods by which the indication of signal 10 could have been changed from proceed to stop, with the track clear between signals 10 and E-198.4.

Conclusions.

This accident is believed to have been caused by the failure of Engineman Rhodes of extra 404, properly to observe and be governed by the stop indication of automatic block-signal 38. Brakemen Hill and Chute were riding on the locomotive and were in position to observe the indication of the signals; they are also at fault for their failure properly to observe their indications.

The evidence does not indicate that the fireman observed the indication of signal 38. The other three members of the crew who were riding on the locomotive were

positive in their statements that its indication changed from stop to proceed when the locomotive was within a short distance of it. This would have been impossible if the signal was functioning properly and if work extra 960 did not move eastward far enough to clear the insulated joints east of signal 10. Not only does the evidence disclose that work extra 960 did not clear these joints, but careful examination of the signal system failed to disclose any improper functioning of the same, and this evidence is supported by the fact that two signalmen and a trackwalker working near signal 38 personally observed it to be in the stop position when it was approached and passed by extra 404, and that the proper indication was displayed immediately after the occurrence of the accident. It is believed the weight of evidence indicates that signal 38 was displaying the proper stop indication and that its indication was not properly observed by the employees on the locomotive of extra 404.

It appears that Head Brakeman Titus, of work extra 960, did not go back as far as possible in the very limited amount of time he had at his disposal. At the maximum estimate he had only 3 minutes in which to protect his train and according to his own estimate had gone back a distance of only 4 or 5 car-lengths; had he gone back as far as possible it is probable that he could have attracted the attention of the crew of extra 404 in time to enable the engineman of that train to reduce its speed to such an extent as to either minimize the seriousness of the collision or to prevent its occurrence.

Had signal 10 been controlled by a stick relay, requiring the operation of the lever in each case to clear the interlocking signal, this being a common arrangement in modern interlocking plants, the indication of the signal would have remained at stop after work extra 960 moved westward clear of the circuit, and it is probable that this accident would then not have occurred, as the evidence indicates that the crew of extra 404 were observing the stop indication of signal 10 and that the train would have been brought to a stop had the signal remained in the stop position.

Engineman Rhodes was employed as a fireman in 1896 and promoted to engineman in 1905. Brakeman Hill was employed as a brakeman in 1913. Brakeman Chute was employed as a brakeman in 1911 and promoted to conductor in 1912. Brakeman Titus was employed as a brakeman in 1906. The records of these men were good.

At the time of the accident the crew of extra 404 had

been on duty about 4 hours after about 13 hours off duty.
The crew of work extra 960 had been on duty about 6 hours
after about 12 hours off duty.