INTERSTATE COMMERCE COMMISSION

Ex Parte No. 176

ACCIDENT NEAR JAMAICA, N. Y.

Submitted November 28, 1950 Decided December 18, 1950

Accident near Jamaica, N. Y., on November 22, 1950, caused by failure to operate the following train in accordance with a signal indication.

Recommended that a train-control system be installed.

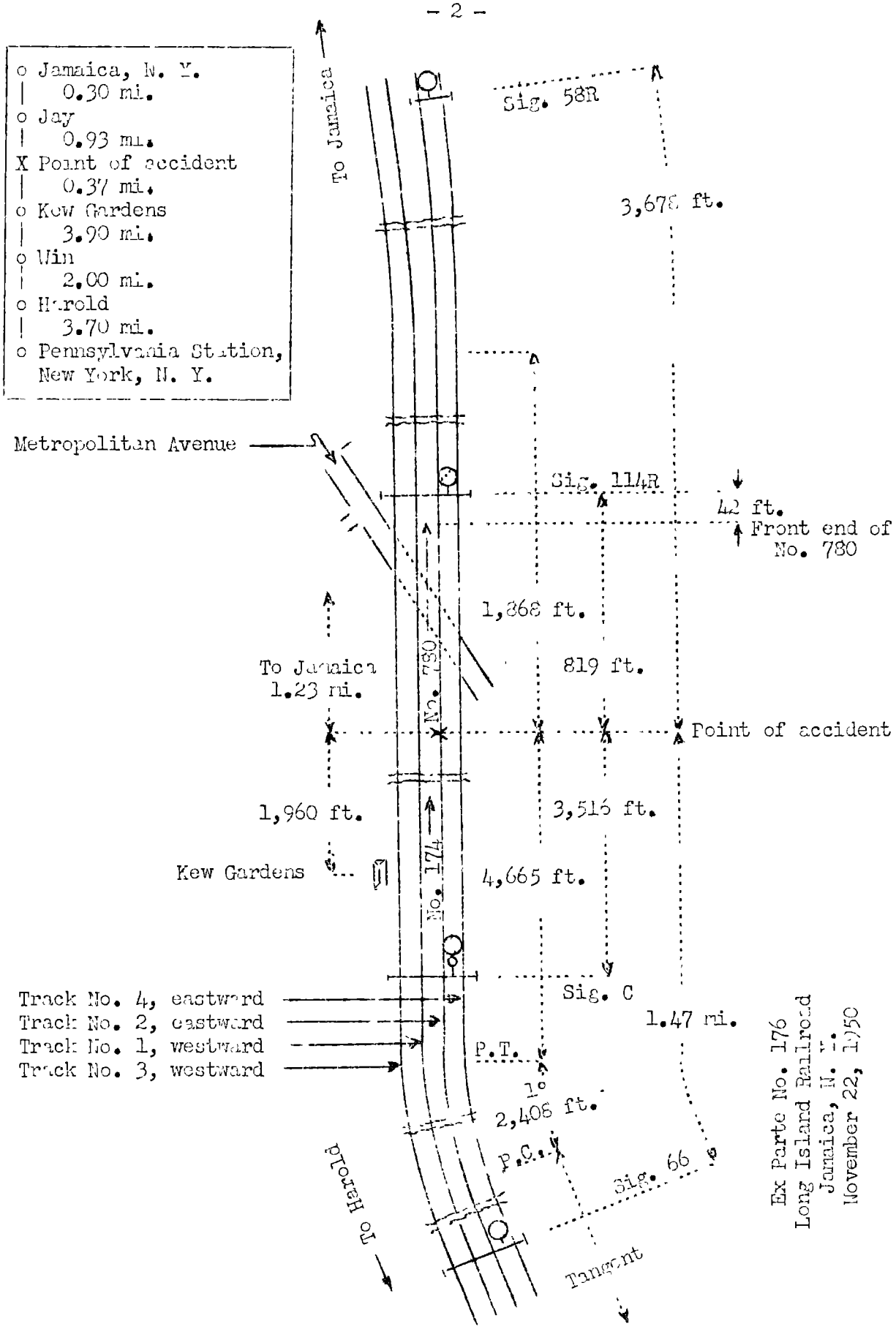
Col. Earle Hepburn for Department of Army Operation of Railroads.
Richard P. Bongartz and Jackson A. Dykman for the trustees of the Long Island Railroad.
Orrin G. Judd for County of Nassau, New York.
E. J. Harkins and James M. O'Connell for Brotherhood of Locomotive Engineers.
George F. D. James for Brotherhood of Railroad Trainmen.
Thomas B. Flynn for United Railroad Workers, Congress of Industrial Organizations.
Henry E. Doliner for American Labor Party.

REPORT OF THE COMMISSION

DIVISION 3, COMMISSIONERS PATTERSON, JOHNSON, AND KNUDSON

PATTERSON, Commissioner:

This is an investigation by the Commission on its own motion with respect to the facts, conditions and circumstances connected with an accident which occurred on the line of the Long Island Railroad near Jamaica, N. Y., on November 22, 1950. Hearing was had at New York, N. Y., on November 25, 27, and 28, 1950. The accident was a rear-end collision between two passenger trains and resulted in the death of 77 passengers and 1 train-service employee and the injury of 352 passengers, 8 train-service employees and 3 other employees.



Ex Parte No. 176
Long Island Railroad
Jamaica, N. Y.
November 22, 1950

Location of Accident and Method of Operation

This accident occurred on that part of the railroad extending between Harold, 3.7 miles east of Pennsylvania Station, New York, and Jamaica, N. Y., a distance of 7.5 miles. In the vicinity of the point of accident this is a four-track line, over which trains moving with the current of traffic are operated by signal indications. The tracks are equipped with power rails for the electric propulsion of trains. The main tracks from south to north are designated as No. 4 and No. 2, eastward, and No. 1 and No. 3, westward. The accident occurred on track No. 2 at a point 6.27 miles east of Harold and 1.23 miles west of Jamaica. From the west on track No. 2 there is a 1° curve to the right 2,408 feet in length and then a tangent 4,665 feet to the point of accident and 1,868 feet eastward. The grade for east-bound trains is 0.3 percent ascending throughout a distance of more than 4,000 feet, then 0.4 percent descending 2,770 feet to the point of accident and a considerable distance eastward.

Automatic signals 66 and C and semi-automatic signals 114R and 58R, governing east-bound movement on track No. 2, are located, respectively, 1.47 miles west, 3,516 feet west, 819 feet east, and 3,678 feet east of the point of accident. These signals are of the position-light type and are continuously lighted. Signal 66 displays three aspects, signal C displays five aspects, and signal 114R displays eight aspects. Signals 114R and 58R are controlled from the interlocking station at Jay, 7.2 miles east of Harold. Aspects applicable to this investigation and the corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
66 C 114R	Three amber lights in diagonal position to the right.	Proceed prepared to stop at next signal. Train exceeding Medium speed must at once reduce to that speed.	Approach.
C	Three amber lights in horizontal position over one amber light.	Stop; then proceed at Restricted speed.	Stop-and-proceed.

114R	Three amber lights in horizontal position over three amber lights in diagonal position to the left.	Proceed at Restricted speed.	Restricting.

The controlling circuits are so arranged that when the block between signal C and signal 114R is occupied, signal 66 indicates Approach and signal C indicates Stop and Proceed. When the block between signal C and signal 114R is unoccupied and the indication of signal 114R is less favorable than Approach, signal C indicates Approach. When the route is lined for movement from signal 114R to signal 58R and the block between these signals is occupied, signal 114R indicates Stop and Proceed if the train occupying the block is less than 1,000 feet east of this signal. Under the same conditions except that the train occupying the block is 1,000 feet or more east of signal 114R, the signal indicates Restricting. When the route is lined for movement from signal 114R to signal 58R, the block between these signals is unoccupied, and the indication of signal 58R is less favorable than Approach, signal 114R indicates Approach.

This carrier's operating rules read in part as follows:

DEFINITIONS

Medium Speed--Not exceeding one-half the speed authorized for passenger trains but not exceeding 30 miles per hour.

Restricted Speed--Not exceeding 15 miles per hour prepared to stop short of train, obstruction or switch not properly lined and to look out for broken rail.

35. The following signals will be used by flagmen:

* * *

Night signals--A red light, torpedoes and fusees.

99. When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure full protection, placing two torpedoes, and when necessary, in addition, displaying lighted fusees.

* * *

Note--When trains are operating under Automatic Block System Rules, the requirements of Rule 99, in so far as protecting against following trains is concerned, will have been complied with when full protection is afforded against trains moving at Restricted speed.

509. A train or engine must stop clear of a block signal indicating Stop. * * * When a train or engine is stopped by a Stop-and-proceed signal, it may then proceed at restricted speed.

The maximum authorized speed for passenger trains was 65 miles per hour.

Description of Accident

No. 780, an east-bound first-class passenger train, consisted of 12 multiple-unit cars of steel construction. It was being operated from the front control compartment of multiple-unit car 1355, the first unit of the train. It passed Win, the last open office, 4.27 miles west of the point of accident, at 6:19 p. m., on time, passed signal C, which indicated Approach, and stopped about 6:26 p. m. on track No. 2 at a point 1.23 miles west of Jamaica. The rear end of the train stopped 3,516 feet east of signal C. About 3 minutes later the rear end of the train was struck by No. 174.

No. 174, an east-bound first-class passenger train, consisted of 12 multiple-unit cars of steel construction. Eight of the cars were motor cars, and four were trailer cars. This train was being operated from the front control compartment of multiple-unit car 1523, the first unit of the train. It passed Win at 6:23 p. m., on time, passed signal 66, which indicated Approach, and stopped at signal C, which indicated Stop and Proceed. It then proceeded eastward on track No. 2, and while moving at an estimated speed of 30 miles per hour it struck the rear end of No. 780.

The rear car of No. 780 was deflected upward when it was struck by the first car of No. 174. As a result, the upper portion of the superstructure of the first car of No. 174 between the front end of the car and the rear vestibule was sheared off by the underframe of the rear car of No. 780 and was demolished. There were no separations between the units of No. 174, and none of the units were derailed. The second to the twelfth cars, inclusive, were slightly damaged.

No. 780 was moved eastward approximately 75 feet by the force of the impact. The trucks of the rear car were moved eastward and stopped in line with the track and underneath the west end of the eleventh car. There were no separations between the units of the train. With the exception of the rear car, none of the units were derailed. The rear car was destroyed, the eleventh car was somewhat damaged, and the other cars, except the first car, were slightly damaged.

The engineer of No. 174 was killed. The conductor, the front brakeman, the flagman, and two ticket collectors of No. 174 and the flagman and two ticket collectors of No. 780 were injured.

The weather was clear and it was dark at the time of the accident, which occurred about 6:29 p. m.

The rear car of No. 780, car 1516, and the first car of No. 174, car 1523, were class MP54a multiple-unit cars of steel construction. Each car was 64 feet 5-3/4 inches in length over the buffers and weighed 114,100 pounds. Car No. 1516 was built in November, 1910, and car No. 1523 in December, 1910. The center sill construction consisted of two 9-inch channels, weighing 15 pounds per foot, spaced 16-3/4 inches apart and with top and bottom cover plates. The top cover plate was 1/4 inch thick and 26 inches wide and the bottom cover plate was 3/8 inch thick and 24 inches wide. The center sills were equipped at each end with draft castings, end castings and a buffer assembly. The buffer plate was 1-1/2 inches thick, 9 inches wide and 37 inches long and was located at the longitudinal center-line of the center sills. The draft castings were attached to the center sills and the center-line of the couplers was 11-3/4 inches below the longitudinal center-line of the center sills. Both cars were equipped with special type Sharon couplers with 5-inch by 7-inch shanks. Each of the two diaphragm end posts consisted of a 5-inch channel weighing 6-1/2 pounds per foot inside a metal shape of 3/16-inch steel. The two vestibule corner posts and the two outside end door posts were metal shapes of 3/16-inch steel and the inside door post a metal shape of 0.06-inch steel. There were two body corner posts at each corner, one a 3/16-inch steel shape and the other a 3-inch by 2-1/2 inch by 1/4-inch angle inside a 3/16-inch steel shape. Side and window posts were 0.11 inch steel shapes. Each car was equipped with two four-wheel trucks spaced 39 feet 9 inches between truck centers and was equipped with 36-inch steel wheels with single type brakes. Each of the two cars was equipped with AMLE electro-pneumatic and automatic air brakes with type LE 3G triple valve and MS EL brake valve.

The other multiple-unit cars of these trains also were equipped with electro-pneumatic and automatic air brakes. A safety-control feature actuated by the controller was provided. If pressure on the controller handle was released, the train brakes would become applied in emergency.

Discussion

As No. 780 was approaching the point where the accident occurred, the engineer was in the control compartment at the front of the first car, the conductor was in the second car, the flagman was in the rear car, and the other members of the train crew were in various locations throughout the cars of the train. The brakes were in electro-pneumatic operation and had functioned properly when used en route. As the train approached signal C, which indicated Approach, the engineer initiated a light service application of the brakes. When the speed had been reduced in compliance with the indication of the signal, this brake application was released. Power was not being supplied to the traction motors, and the train continued to move at a speed of approximately 30 miles per hour. As the train approached signal 114R, which indicated Restricting, the engineer initiated another service application of the brakes. He said that he placed the brake-valve handle in release position when the speed of the train had been reduced to about 15 miles per hour, but the speed continued to diminish and the train stopped with the front end of the first car 42 feet west of the signal. The engineer was of the opinion that the brakes had not released properly. In order to effect the release of the brakes after the train stopped, he placed the switch in position for conventional automatic operation of the brakes, made a brake-pipe reduction of 20 pounds, and then placed the brake valve in release position. When the brakes did not release immediately, he made an emergency application. The collision occurred before sufficient time had elapsed for this brake application to be released. When the train stopped, the flagman was at the front end of the rear car. He said he proceeded to the rear vestibule, obtained a lighted red lantern, and alighted from the train to provide flag protection. When he was several feet west of the rear end of the train, he heard a sound indicating that power was being supplied to the traction motors. He said he assumed that the train was about to proceed and therefore re-entered the rear vestibule and sounded a proceed signal on the communicating signal system. The train did not proceed immediately, and he repeated the signal. He was about to alight from the car a second time when he observed No. 174 approaching at a distance of about 1,000 feet. He gave a stop signal with a flashlight, but did not take further action to provide protection before the collision occurred. He did not display a lighted fusee at any time after the train stopped.

He said that the marker lights were lighted and were in their proper positions on the rear of the rear car before the train departed from New York, but he did not observe them after that time.

The route was lined for the movement of No. 780 from signal 114R to signal 58R before No. 780 stopped west of signal 114R. However, the block of signal 114R was occupied by an east-bound train immediately west of signal 58R and as a result signal 114R indicated Restricting for No. 780. After No. 780 stopped at signal 114R, the preceding train moved eastward and cleared the block of signal 114R. This caused the indication of signal 114R to change from Restricting to Approach, and the change was observed by the engineer of No. 780. Signal 114R is located on a signal bridge which spans the four tracks, and the aspect can be seen from the operating compartment of an east-bound car at any point between signal C and signal 114R.

As No. 174 was approaching the point where the accident occurred, the engineer was alone in the control compartment at the front of the first car, and the members of the train crew were in various locations throughout the cars of the train. The brakes of this train had functioned properly when used en route. The headlight was lighted. Members of the crew said that the train was stopped at signal C and then proceeded eastward. The conductor said that at first the speed was low, but when the second car, in which he was located, was in the vicinity of the station at Kew Gardens, 1,960 feet west of the point of accident, there was a noticeable increase in speed. This increase continued until the speed was about 35 miles per hour, then the brakes of the train were applied in emergency. The collision occurred a few seconds later. The engineer of No. 174 was killed, and it could not be determined why the train was not operated at restricted speed throughout the length of the block as required by the indication of signal C. However, the indication of signal 114R changed to a more favorable one after No. 174 passed signal C, and from the manner in which the train was controlled it appears probable that the engineer observed the aspect of signal 114R when the indication changed from Restricting to Approach, assumed that the train immediately preceding No. 174 had cleared the block of that signal, and immediately increased the speed of his train. Apparently he made an emergency application of the brakes when he first saw the preceding train, but there was insufficient distance in which materially to reduce the speed before the collision occurred.

After the accident occurred, the brakes of the cars of each train, except the rear two cars of No. 780 and the first car of No. 174, were tested and they functioned properly.

The brakes of the above three cars were damaged to the extent that they could not be tested. All of the wheels on each unit of No. 174 were inspected and no slid-flat spots or skid marks were found. This indicates that the wheels of No. 174 were not sliding before the accident occurred. The automatic block-signal system was tested and no defective condition was found. Signals 66 and C were under continuous observation by employees of the signal department of the railroad throughout a period of three days after the accident occurred, and they functioned properly throughout that period.

On the Long Island Railroad an automatic train-stop device of the tripper type is provided on 7.7 miles of the line. These devices automatically cause an emergency application of the brakes when a train passes a stop signal unless the train first is stopped and the tripper device then is manually operated to the non-tripping position. They are located on that part of the Atlantic Branch which extends between Dunton, 0.6 mile west of Jamaica, and Flatbush Avenue, and at two drawbridges on the Rockaway Beach Branch. An automatic train stop of the tripper type, or any other automatic train stop of the intermittent type, probably would not have prevented the accident here under investigation. If such a tripper device had been in use, the engineer could have placed the tripper in non-tripping position after the train was stopped at signal C and then proceeded without further restriction than was imposed by the signal indication. With other automatic train-stop devices of the intermittent type as now used on other railroads the automatic application of the brakes can be forestalled by the operation of an acknowledging device, and the train can then proceed without further automatic restriction. An automatic block-signal system is in service on 159.7 miles of this line which include those portions of the line of greatest traffic density. This territory includes that part of the line extending between Harold and Babylon. An automatic cab-signal system is in service on 44.1 miles of this line. This territory includes the double-track line extending between Harold and Great Neck, the single-track line extending between Great Neck and Port Washington, and the double-track line extending between Fillside, 1.4 miles east of Jamaica, and Babylon. These signals continuously provide an aspect in the operating compartment of each train to indicate track conditions ahead. If a cab-signal system had been in use on the line where this accident occurred, a Restricting aspect would have been displayed continuously in the engineer's compartment of No. 174 after it passed signal C, which would have indicated that the preceding train had not

cleared the block, and the accident might not have occurred. The motor cars which are operated over this line are equipped with automatic cab-signal apparatus, and, to extend the cab-signal installation between Herold and Hillside, it would be necessary only to install track equipment. This could be accomplished in a short period of time, and would at once provide a measure of increased protection. This extension of the existing cab-signal system should be undertaken immediately.

During the 30-day period preceding the day of the accident, the average movement daily except Saturdays and Sundays in the vicinity of the point of accident was 370 trains. Less than 1 percent of these movements were freight trains. The maximum traffic density eastward occurs between 5 p. m. and 6 p.m. and the maximum traffic density westward occurs between 8 a. m. and 9 a. m. During such periods the traffic density is about four times greater than the average of the remainder of the day. The exceptionally close spacing of trains required during these periods renders it necessary to provide the most effective means available to safeguard such traffic. While a cab-signal system superimposed upon an automatic block-signal system provides a substantial increase in protection as compared with a system using roadway signals only, the cab-signal system does not automatically and continuously enforce compliance with the speed restrictions imposed by restrictive signal indications. The Commission investigated an accident on this line which occurred at Rockville Centre on February 17, 1950, which resulted in the death of 31 persons and the injury of 158 persons. The line on which this accident occurred was equipped with automatic block-signal and cab-signal systems. These systems were functioning properly and indicated to the engineer of the east-bound train that a stop was required at the entrance of the block in which the accident occurred. However, the engineer did not take action in time to stop the train at the stop signal, and the train was moving at a speed of 25 miles per hour when the collision occurred.

Automatic train-control systems which continuously enforce prescribed speed limits have been developed and are used on other railroads. If such an automatic train-control system had been in use on this line, in both of these cases the speed of the trains involved would have been automatically restricted to the prescribed limit and the accidents either would have been averted or their severity greatly reduced. Therefore, as a means of providing for the maximum protection of the dense traffic on this line, steps should at once be taken by the carrier to install an automatic train-control system which automatically and continuously will enforce compliance with

the requirements of automatic block-signal and cab-signal indications.

Cause

It is found that this accident was caused by failure to operate the following train in accordance with a signal indication.

Recommendation

It is recommended that the trustees of the Long Island Railroad Company extend the automatic cab-signal system to its line between Harold and Hillside, and install a train-control system on that part of the line above referred to and also on that part of its line now equipped with an automatic cab-signal system which train-control system will automatically and continuously enforce a speed restriction of not exceeding 12 miles per hour for trains when entering and while proceeding through a block occupied by a preceding or opposing train. Unless the Commission is advised within 30 days after this report is served that these recommendations will be complied with, consideration will be given to the institution of a further proceeding under Section 25 of the Interstate Commerce Act.

By the Commission, Division 3.

W. P. BARTEL,

(SEAL)

Secretary.