3736A

INTERSTATE COMMERCE COMMISSION

Ex Parte No. 209

ACCIDENT NEAR RIPLEY, N. Y.

Decided April 25, 1957

Accident near Ripley, N. Y., on February 8, 1957, caused by failure to operate the passenger train in accordance with signal indications.

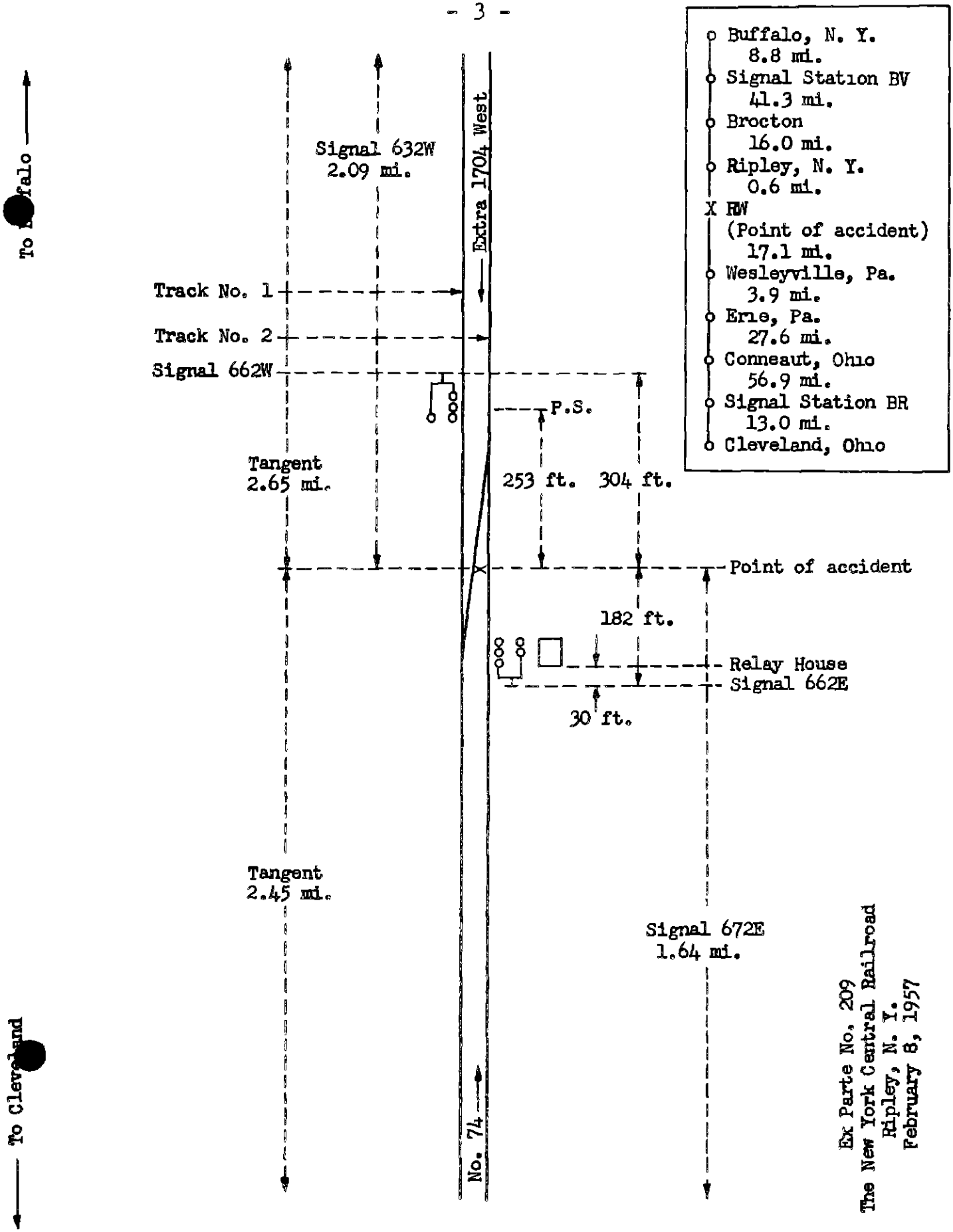
Wayne M. Hoffman for the New York Central Railroad Company.
Perry S. Heath for the Brotherhood of Locomotive Engineers.
Edward T. Walsh for the New York State Legislative Board, Brotherhood of Locomotive Engineers.
R. E. Brown, Jr., for N. W. Thompson, as General Chairman of the Brotherhood of Locomotive Firemen and Enginemen, New York Central, Western District.
Ralph T. Eller for the Brotherhood of Locomotive Firemen and Enginemen, N. W. Thompson.
L. E. Gerard for the Order of Railway Conductors and Brakemen; Conductor E. G. Kuntz (Train No. 74), and Brakeman William Shores (Train No. 74).
Robert A. Malloy for New York Central, Western District Employees under jurisdiction of Brotherhood of Railroad Trainmen - Western District General Committee.
K. D. Pattison for W. H. Porter, Head Brakeman on Extra 1704 West, representative for Brotherhood of Railroad Trainmen, Lodge 84.
Samuel E. Kellog for A. W. Stotz, Brotherhood of Locomotive Engineers.
C. F. Barton for Brotherhood of Locomotive Engineers, Division 421.
Robert A. Malloy for Raymond Doherty, Flagman on Train No. 74, representative for Brotherhood of Railroad Trainmen, Lodge 187, Buffalo.
W. G. Brown as observer, New York State Public Service Commission.
F. J. Spangenberger as observer, New York State Public Service Commission.
Thomas P. McGuinness for Brotherhood of Locomotive Fireman and Enginemen, representing Fireman H. Steves.
Harold N. McLaughlin for the Brotherhood of Locomotive Engineers.

REPORT OF THE COMMISSION

DIVISION 3, COMMISSIONERS TUGGLE, MURPHY, AND MINOR

TUGGLE, 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 New York Central Railroad near Ripley, N. Y., on February 8, 1957. Hearing was had at Buffalo, N. Y., on February 20 and 21, 1957. The accident was a side collision between a freight train and a passenger train. It resulted in the death of one train-service employee, and the injury of one passenger.



Ex Parte No. 209
The New York Central Railroad
Ripley, N. Y.
February 8, 1957

Location of Accident and Method of Operation

This accident occurred on that part of the Erie Division extending between Signal Station BV, near Buffalo, N. Y., and Signal Station BR, near Cleveland, Ohio, 163.4 miles. In the vicinity of the point of accident this is a two-track line, over which trains moving in either direction on either track are operated by signal indications supplemented by an intermittent inductive automatic train-stop system. The main tracks from north to south are designated as track No. 1 and track No. 2. At RW, 66.7 miles west of Buffalo and 0.6 mile west of Ripley, N. Y., a crossover connects the two main tracks. This crossover is facing-point for west-bound movements on track No. 2. The switches are power-operated. The accident occurred 253 feet west of the east crossover-switch, at the fouling point of the crossover and track No. 2. The main tracks are tangent throughout a distance of 2.65 miles immediately east of the point of accident and 2.45 miles westward. From the west the grade is 0.29 percent descending a distance of 2 miles, and 0.18 percent descending 830 feet to the point of accident.

Semi-automatic signal 632W, governing west-bound movements on track No. 2, and semi-automatic signal 662W, governing west-bound movements on track No. 2 and from track No. 2 to track No. 1 at RW, are located, respectively, 2.09 miles and 304 feet east of the point of accident. Automatic signal 672E and semi-automatic signal 662E, governing east-bound movements on track No. 2, are located, respectively, 1.64 miles and 182 feet west of the point of accident. These signals are of the color-light type and are approach lighted. The aspects applicable to this investigation and the corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
632W	Yellow-over-flashing green	PROCEED, APPROACHING NEXT SIGNAL AT LIMITED SPEED. TRAIN EXCEEDING 60 M.P.H. MUST AT ONCE REDUCE TO THAT SPEED. REDUCTION TO 60 M.P.H. MUST COMMENCE BEFORE PASSING SIGNAL AND BE COMPLETED BEFORE ACCEPTING A MORE FAVORABLE INDICATION.	APPROACH LIMITED

662W	Red-over-flashing green-over red	PROCEED; LIMITED SPEED WITHIN INTERLOCKING LIMITS	LIMITED CLEAR
672E	Yellow-over-number plate	PROCEED PREPARING TO STOP AT NEXT SIGNAL. TRAIN EXCEEDING MEDIUM SPEED MUST AT ONCE REDUCE TO THAT SPEED. REDUCTION TO MEDIUM SPEED MUST COMMENCE BEFORE PASSING SIGNAL AND BE COMPLETED BEFORE ACCEPTING A MORE FAVORABLE INDICATION.	APPROACH
672E	Green-over-number plate	PROCEED	CLEAR
662E	Red-over-red	STOP	STOP

These signals form part of a traffic-control system which, except for a short distance in the vicinity of Erie, Pa., 87.7 miles west of Buffalo, extends between a point approximately 9 miles west of Buffalo and a point approximately 15 miles east of Cleveland. The control machines are located at Erie. They are operated by train dispatchers. The control circuits are so designed that a controlled signal will not display an aspect to proceed when any opposing controlled signal or signal governing movements over a conflicting route is displaying other than its most restrictive aspect, when the block between adjacent controlled points is occupied by an opposing train, or when a switch within the route governed by the signal is not in proper position and locked. Time, indication, and route locking are provided. The time locking for the controlled signals at RW is set for 5 minutes. When the route is lined for a west-bound movement from track No. 2 to track No. 1 at RW and the blocks of the signals are clear, signal 632W indicates Proceed-approaching-next-signal-at-limited-speed, signal 662W indicates Proceed-limited-speed-within-interlocking-limits, signal 672E indicates Proceed-preparing-to-stop-at-next-signal, and signal 662E indicates Stop. Signal 672E indicates Proceed only when the block of the signal is clear and signal 662E indicates either Proceed, Proceed-approaching-next-signal-at-limited-speed, or Proceed-preparing-to-stop-at-next-signal.

The signal system in the vicinity of the point of accident is supplemented by an intermittent inductive automatic train-stop system. The system consists of wayside inductors, which are interconnected with the signal system, and of receivers, relays, and related apparatus on the locomotives. The inductor is a U-shaped device with a laminated magnetic core fitted with pole pieces. It is located on the ties, outside the rails and parallel to them, and from 70 to 90 feet in approach of the wayside signal. The core is wound with a coil which is connected to a relay of the signal system. When the signal displays a non-restrictive aspect the circuit of the coil is closed. Under this condition the train-stop apparatus of a passing locomotive is not actuated. When the signal displays a restrictive aspect the circuit of the coil is open, and the train-stop apparatus of a passing locomotive will be actuated to cause an automatic application of the brakes unless the engineer operates an acknowledging lever as the locomotive passes the inductor. The brakes will also become applied automatically if the acknowledging lever is held in acknowledging position during a period of more than 15 seconds. A whistle in the control compartment sounds each time an automatic brake application is forestalled by use of the acknowledging lever. If the automatic train-stop system is functioning properly the tape of the speed-recording device on each locomotive is marked each time the locomotive passes the inductor at a restrictive signal, and an inspection of the tape will disclose the location of each restrictive signal passed by the locomotive on a trip and whether brake applications were forestalled at these signals.

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

DEFINITIONS

LIMITED SPEED.--A speed not exceeding fifty miles per hour.

MEDIUM SPEED.--A speed not exceeding thirty miles per hour.

Timetable special instructions read in part as follows:

AUTOMATIC TRAIN STOP.

* * *

c. When automatic train stop device becomes inoperative after leaving terminal, trains must be operated at a speed not exceeding 35 miles per hour. * * *

* * *

When forestalling whistle fails to sound while forestalling, engineman will reduce to and operate at speed specified in Paragraph C until he has occasion to again forestall as prescribed by the rules, and the whistle sounds; normal speed may then be resumed. * * *

The maximum authorized speed for passenger trains in the vicinity of the point of accident is 80 miles per hour.

Description of Accident

Extra 1704 West, a west-bound freight train, consisted, at the time of the accident, of Diesel-electric units 1704, 2463, and 2434, coupled in multiple-unit control, 76 cars, and a caboose. This train passod Signal Station BV at 2:19 p. m. It entered track No. 2 at a crossover near Brocton, 16.0 miles east of Ripley, passed signal 632W, which indicated Proceed-approaching-next-signal-at-limited-speed, passed signal 662W, which indicated Proceed-limited-speed-within-interlocking-limits, and the front end of the train crossed from track No. 2 to track No. 1 at RW. While the train was moving through the crossover at a speed of 50 miles per hour, as indicated by the tape of the speed-recording device, the twenty-seventh car was struck by No. 74. The accident occurred 253 feet west of the east crossover-switch, at the fouling point of the crossover and track No. 2.

No. 74, an east-bound first-class passenger train, consisted of Diesel-electric units 4206 and 4074, coupled in multiple-unit control, three baggage cars, and three coaches, in the order named. This train departed from Wesleyville, Pa., 17.1 miles west of RW, on track No. 2 at 4:15 p. m. It passed signal 672E, which should have indicated Proceed-preparing-to-stop-at-next-signal, passed signal 662E, which should have indicated Stop, and while moving at a speed of 28 miles per hour, as indicated by the tape of the speed-recording device, it struck the twenty-seventh car of Extra 1704 West.

The twenty-eighth to the fifty-fifth cars, inclusive, of Extra 1704 West, and the locomotive and the first three cars of No. 74 were derailed. The derailed cars of Extra 1704 West stopped in various positions on or near the tracks. Thirteen of these cars were destroyed, eight were badly damaged, and seven were somewhat damaged. The twenty-seventh car was slightly damaged. No. 74 stopped with the front of the locomotive 167 feet east of the point of collision and several feet south of the center-line of track No. 2. The Diesel-electric units and the derailed cars of this train stopped approximately in line. The first car overturned to the south, the Diesel-electric units and the second car leaned to the south at angles of from 30 to 45 degrees, and the third car remained upright. All of the derailed equipment was considerably damaged, and the fourth car of this train was slightly damaged.

The engineer of No. 74 was killed.

The sun was shining at the time of the accident, which occurred at 4:29 p. m.

Discussion

In order to avoid possible delay to No. 43, a west-bound passenger train moving on track No. 1 behind Extra 1704 West, the train dispatcher crossed Extra 1704 West from track No. 1 to track No. 2 at a crossover near Brocton. At this time No. 74 was standing at Wesleyville. After No. 74 departed from Wesleyville the dispatcher saw that Extra 1704 West would meet No. 74 before being overtaken by No. 43, and he lined the route for Extra 1704 West to cross back from track No. 2 to track No. 1 at RW. The indicator lights on the control machine indicated that the system functioned properly. The dispatcher did not move any of the levers controlling switches or signals at RW after he lined the route for the movement of Extra 1704 West. According to the record on the traingraph, the locomotive of Extra 1704 West passed signal 662W at 4:29 p. m.

As Extra 1704 West was approaching the point where the accident occurred the enginemen and the front brakeman were in the control compartment at the front of the locomotive. Signal 632W indicated Proceed-approaching-next-signal-at-limited-speed and signal 662W indicated Proceed-limited-speed-within-interlocking-limits when the employees on the locomotive first saw them, and there was no change in the indication of either signal before the front of the locomotive passed.

The employees on the locomotive first saw No. 74 approaching at a distance which they thought was about 1/2 mile. They could see that the brakes of No. 74 were applied as that train passed them, and until the brakes of their train became applied in emergency as a result of the collision they were not aware that No. 74 would not stop short of signal 662E.

As No. 74 was approaching the point where the accident occurred the engineer and the fireman were in the control compartment at the front of the locomotive. The members of the train crew were in the cars of the train. Signal 672E indicated Proceed-preparing-to-stop-at-next-signal when it first became visible to the enginemen, and the indication was called by these employees. The engineer then made a service application of the brakes. From the fireman's position in the control compartment he could not see the acknowledging lever of the automatic train-stop equipment, but from the engineer's movements the fireman assumed that he pulled the lever into forestalling position as the locomotive was closely approaching the signal. The fireman testified that immediately before the front of the locomotive passed the signal the indication of the signal changed to Proceed. The forestalling whistle did not sound as the locomotive passed the signal, and after passing the signal the engineer commented that the whistle had not sounded. The fireman told him that the indication of the signal had changed to Proceed as they were closely approaching and that this was the reason for the absence of a whistle. The engineer replied that he, too, thought the indication of the signal had changed, and he then released the brakes and increased the speed of the train. In this vicinity the tracks extend from southwest to northeast. The sun was low in the sky, and because of the rays of the sun on the face of signal 662E the employees on the locomotive could not determine the indication of the signal from a distance. When No. 74 and Extra 1704 West were a distance apart which the fireman thought was about 1/2 mile the enginemen saw the headlight of Extra 1704 West and became aware that that train was moving on track No. 2. The engineer immediately made an emergency application of the brakes. After this occurred the fireman did not notice the indication of signal 662E. According to the tape of the speed-recording device, No. 74 approached signal 672E at a speed of 78 miles per hour. A service application of the brakes was made at a point about 1,320 feet west of the signal, and the speed was reduced to approximately 65 miles per hour as the train passed the signal and to slightly less than 60 miles per hour at a point about 675 feet east of the signal. The speed then increased to 68 miles per hour at a point about 2,300 feet west of signal 662E. An emergency application of the brakes was made at the latter point, and the speed had been reduced to 28 miles per hour when the collision occurred.

A signal foreman employed by the carrier who was driving on an adjacent highway reached the scene of the accident soon after the accident occurred. He immediately proceeded to the relay house at RW and disconnected the track relays for the tracks involved. He then proceeded to signal 672E and disconnected the track relays at that point. This is in accordance with standing instructions of the carrier in the event of a collision or derailment in order to insure that no signal will be displayed for movement on a track which may be fouled by derailed equipment. The signal foreman found the doors of both relay houses locked when he arrived, and he locked the door of each house when he left.

The relay house at RW is 30 feet east of signal 662E. After the accident occurred a passenger who was on No. 74 alighted and walked to the front of the train. On his way he noticed that the door of the relay house was open and that there was no one in the house. After he reached the front of the train he returned and boarded the first coach. As he passed the relay house he saw that the door was still open. The exact times that this witness passed the relay house as compared with the time that the signal foreman arrived were not determined.

The chief signal engineer of the carrier testified that except for disconnecting the track relays no changes or adjustments to the signal equipment were made between the time the accident occurred and the time inspections and tests of the signal equipment were begun on the day after the accident occurred. When the positions of the relays were examined during the inspection of the signal equipment it was found that the control relay for signal 672E was deenergized, causing the signal, when lighted, to display a red aspect. The polar contacts controlling the yellow aspect of the signal were in reverse position, indicating that a yellow aspect was the last aspect displayed by the signal prior to the red aspect. The signal circuits are so designed that in order for the signal to display a yellow aspect the control relay for signal 672E must be energized and the polar contacts of the relay must be in reverse position. In order for the signal to display a green aspect the control relay must be in energized position and the polar contacts of the relay must be in normal position. When a train passes the signal and enters the track circuit beyond the signal the track relay for this track circuit is deenergized. This opens the control circuit for the control relay of signal 672E deenergizing the relay and causing the signal to display a red aspect but leaving the polar contacts in their last position. The control relay for signal 672E cannot be energized or the position of the polar contacts changed by energy applied to the control circuit for this relay at the relay house at RW as long as

any track circuit between signal 662E at RW and signal 672E is deenergized. Further inspections and tests disclosed that the automatic train-stop inductor at signal 672E was defective and the automatic train-stop apparatus on a locomotive passing it would not be actuated. The condition of an inductor has no effect on the operation of the signal system, and no condition was found which would have caused an improper operation of the signal system. With the exception of the defective inductor at signal 672E, no condition was found which would have caused an improper operation of the automatic train-stop system.

The tape removed from the speed-recording device on the locomotive of No. 74 indicated that the automatic train-stop apparatus on the locomotive had been actuated at the inductor at a restrictive signal at Wesleyville and that the engineer had forestalled an automatic brake application at this point. The train-stop apparatus had also been actuated at signal 662E, but it had not been actuated when the locomotive passed signal 672E. The inductor at the latter signal was the one which was found to be defective after the accident occurred. The automatic train-stop apparatus on the locomotive of No. 74 was tested after the accident occurred and was found to function properly.

The defective inductor was removed from service and the laminated steel core and coil removed from the cast bronze housing in which it was assembled. The coil was then unwound from the core. The coil consisted of 1,825 turns of 0.0764-inch diameter enameled-double-cotton-covered varnished wire wound on the core in 15-1/2 layers to form a coil 12-3/4 inches long. The assembled coil was wrapped with a cotton tape impregnated with an asphalt compound which had to be removed before the coil could be unwound. It was found there were separations between the turns in the windings at 4 inches from one end of the coil and at a second spot 7 inches from the same end of the coil. At these places the winding was colored with a rust stain from moisture that had entered between the coil and the core and then seeped through the windings where the turn separations had occurred. At the place 7 inches from the end of the coil bare spots where the insulation had deteriorated were found on the winding at the bottom of the coil on every layer from the seventh to the fourteenth layer. At the place 4 inches from the end of the coil bare spots appeared at the fourteenth, fifteenth, and sixteenth layers. It was apparent that moisture entering at the end of the coil between the core and the windings and then seeping through the coil where the separations occurred had caused the insulation to deteriorate to the point where a sufficient number of turns of the winding were short circuited to result in failure of the train-stop apparatus on a locomotive to be actuated regardless of the indication of the signal.

On October 17, 1956, prior to placing this inductor in service at signal 672E in connection with the installation of the traffic-control system in this territory, a complete electrical test in accordance with the carrier's specifications was made of the inductor. The carrier's records show that the inductor met all requirements of these tests. On November 12 during the semiannual tests of all inductors in this territory, to comply with Commission requirements, no defective condition in this inductor was recorded by the instruments of the carrier's automatic train-stop test car when it passed signal 672E.

The tests of the signal system after the accident occurred disclosed no condition which would have caused an improper operation of the signals, and from the results of these tests it appears that the signals were functioning properly at the time of the accident. Apparently the fireman of No. 74 was mistaken as to the indication of signal 672E, and the fact that the forestalling whistle did not sound as the locomotive passed the defective inductor undoubtedly confirmed his impression that the indication of the signal had changed to Proceed.

On the day of the accident the brakes of No. 74 were tested and were found to function properly before the train departed from Cleveland, the initial terminal. After leaving Cleveland the engineer remarked that heavier brake applications than usual were required to stop the train, and in stopping at Conneaut, Ohio, 67.3 miles east of Cleveland, he overran the station a distance of 500 or 600 feet. When the train arrived at Erie it was found that there were flat spots on one pair of wheels on the second car, an empty baggage car, and this car was set off at Wesleyville. A car foreman who inspected the car later found that this pair of wheels had been sliding as a result of defective brake rigging and not as a result of a heavy brake application. The train made no stops between Wesleyville and the point of accident.

After the accident occurred the brakes on the rear three cars of No. 74 were found to be applied. The brakes on these cars were tested and were found to function properly. The brake equipment on the third car of the train appeared to function properly, but the brake rigging was bent during the derailment and the length of piston travel before the accident occurred could not be determined. The brake equipment on the first two cars was damaged to the extent that it could not be tested. The undamaged portion of the brake equipment of the locomotive was tested at the shops of the carrier at Collinwood, Ohio, and no condition was found which would adversely affect the operation of the brakes.

We find that:

1. The signals involved in the accident were operating properly at the time of the accident.

2. The automatic train-stop inductor at signal 672E was defective.

3. The accident was caused by failure to operate No. 74 in accordance with the indications of signals 672E and 662E.

4. The failure of the automatic train-stop system to function as intended as No. 74 passed signal 672E was a contributory factor in the cause of the accident.

By the Commission, Division 3.

(SEAL)

HAROLD D. McCOY,
Secretary.