INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE CHICAGO, SOUTH SHORE AND SOUTH BEND RAILROAD NEAR GARY, IND., ON APRIL 10, 1926.

May 12, 1926.

To the Commission:

On April 10, 1926, there was a head-end collision between two passenger trains on the Chicago, South Shore and South Bend Railroad near Gary, Ind., which resulted in the death of 1 passenger, and the injury of 11 passengers and 4 employees.

Location and method of operation

This railroad is an electric line extending between Kensington, Ill., and South Bend, Ind., a distance of 75.6 miles. The Western Division, on which this accident occurred, covers that portion of the road between Kensington and Gary, Ind., and is a double-track line over which trains are operated by time-table and train orders. At the point where the accident occurred, about 4 miles west of Gary, there is a bridge over the tracks of the Elgin, Joliet and Eastern Railroad, there being a gauntlet track across this bridge and also on the approaches leading to the bridge, the length of this gauntlet track is 1,474 feet. This section of gauntlet track is protected by automatic signals of the color-light type which display either red or green indications for stop or proceed, respectively.

The bridge is 110 feet in length. Approaching from the east there is a signal governing westbound movements located 670 feet from the beginning of the gauntlet track, followed by 642 feet of gauntlet track extending to the eastern end of the bridge. Approaching from the west there is a signal 688 feet from the beginning of the gauntlet track, followed by 722 feet of gauntlet track extending to the western end of the bridge.

The control circuit of the westbound signal begins at a point 1,216 feet west of the eastbound signal, so that when the track between this point and the westbound signal is occupied the westbound signal displays a stop indication. The control of the eastbound signal begins at the insulated joints located at the westbound signal, and a train occupying

the track between these signals causes both signals to display stop indications. In other words, there is a track circuit extending west of the eastbound signal which affects only the indication of the westbound signal, while there is another track circuit between the two signals which is common to both of the signals.

The signal involved in the accident was the one governing the movement of westbound trains over the gauntlet track, and the point of accident was on the eastern approach to the bridge, 216 feet from the eastern end of the gauntlet track. Approaching the point of accident from the east the track is tangent for a distance of 4,994 feet; approaching from the west there is a 3° curve to the left 1,000 feet in length, beyond which point the track is tangent to the point of accident, a distance of 2,247 feet. The track is level in each direction for a considerable distance except for the approaches at each end of the bridge, which are about 1,200 feet in length and are on ascending grades of 2.5 per cent.

The weather was clear at the time of the accident, which occurred at about 12.02 p.m.

Description

Eastbound second-class passenger train No. 63 consisted of motor car 9, of steel-underframe construction, and was in charge of Conductor Landis and Motorman Tibbits. It left Kensington at 11.30 a.m., passed Calumet 2.27 miles west of the point of accident and the last open office, at 11.58 a.m., on time, received a clear indication at the signal governing eastbound movements over the gauntlet track passed over the bridge and was descending the grade on the eastern side of the bridge when it collided with train No. 64.

Westbound second-class passenger train No. 64 consisted of motor car 6, of steel-underframe construction, and trailer 111, of wooden construction, the train being in charge of Conductor Dabbert and Motorman Kull. It left Cary at 11.55 a.m., on time, received a clear indication at the westbound signal and was ascending the grade leading to the bridge when it collided with train No. 63. At the time of the accident the speed of each of the trains involved was estimated to have been about 15 miles an hour.

Motor car 9 telescoped the head end of the first car in train No. 64 for a distance of about 5 feet, but neither of the cars was derailed. Fire broke out in the wreckage and both of these cars were destroyed. The second car in train No. 64 was only slightly damaged, it was cut off from the car ahead of it in time to prevent its destruction by fire.

Summary of evidence

Motorman Kull, of train No. 64, said that on reaching the tangent track approaching the point of accident he saw a green indication displayed by the westbound signal, indicating that the gauntlet track was clear, and he said this signal was still displaying a green indication when his train passed it. He made a service application of the brakes and estimated that his train entered the gauntlet track at a speed of about 15 miles an hour. When the car was about halfway up the incline he saw the head end of train No. 63 as it came across the bridge and at once applied the air brakes in emergency, and he said he felt so sure that the cars were going to stop that he did not make any attempt to get out of the motorman's vestibule.

Conductor Dabbert, of train No. 64, said an air-brake application was made as the train approached the westbound signal and that the speed was about 35 miles an hour when the signal was passed. As the train was ascending the grade leading to the bridge he felt an emergency application of the air brakes and he estimated that the train traveled a distance of about two car-lengths before the collision occurred. After assisting passengers, he went back to a telephone booth to talk with the dispatcher and as he passed the westbound signal he noted that it was not displaying an indication of any kind. Upon leaving the booth, however, he again looked at the signal and he said it was then displaying a stop indication. It further appeared from the statements of Conductor Dabbert that he had been over this gauntlet track earlier in the day on trains Nos. 46, 53, and 59, and that on none of these occasions was the train brought to a stop nor was anything said to him by the motorman to indicate that there had been anything wrong with the operation of the signals.

R. C. Iseminger, collector on train No. 64, was riding in the first car of the train at the time of the accident. He said he felt a service application of the air brakes at about the time the train was passing the westbound signal, moving at a speed of about 20 miles an hour, and there was another application just before the accident occurred. In-

mediately after the occurrence of the accident he went back to the telephone booth to notify the dispatcher of the occurrence of the accident and at that time noticed that no signal indication of any kind was being displayed by the westbound signal, later he observed that the signal was displaying a stop indication.

Motorman Tibbits, of train No. 63, said the eastbound signal was displaying a proceed indication, that his train passed the signal at a speed of about 25 miles an hour and entered on the bridge at a speed of 25 or 30 miles an hour. He then observed train No. 64 entering the opposite end of the gauntlet track and at once applied the air brakes in emergency, opened the sanders and reversed the motor. He said the emergency application was made when his train was at the eastern end of the bridge and estimated that its speed had been reduced to 10 or 12 miles an hour by the time the accident occurred. Motorman Tibbits further stated that he had operated trains through this gauntlet track on several occasions on the day of the accident and that the signals had been working properly at all times.

Conductor Landis, of train No. 63, said his train was about halfway between the eastern end of the bridge and the eastern end of the gauntlet track when he felt what he thought was a service application of the air brakes followed by the reversing of the motor, the collision occurring immediately afterwards, at which time the speed of his train was about 15 miles an hour. The statements of Collector Kroenig, also of train No. 63, brought out nothing additional of importance.

A consideration of the distances, speeds, and signal control circuits indicated clearly that train No. 63 was on the control circuit of the westbound signal before train No. 64 reached that point, but that for some reason the signal failed to display a stop indication. General Superintendent Gray, who reached the scene of the accident less than half an hour after its occurrence, expressed the opinion that the westbound signal had displayed the various indications testified to by the employees, i.e., proceed when it was approached and passed by train No. 64, not burning when first observed shortly after the occurrence of the accident, and stop when observed at a later time. This condition, he said, was probably due to a defective relay and the tests of the relay witnessed by him since that time confirmed this opinion.

The signal installation at this point was placed in service in 1911, and on April 7, 1926, revised line and track circuits were placed in service. As at present arranged the signals operate in the following manner. An eastbound train on reaching the approach overlap section controlling the westbound signal shunts out the vane frequency relay, which opens the control circuit of the line relay at the westbound signal, causing that signal to display a stop indication. When the train leaves the approach section the centrifugal frequency track relay is shunted out, holding open the control circuit for the line relay at the westbound signal and also changing the indication of the eastbound signal from proceed to stop A westbound train shunts out the centrifugal frequency relay governing the track between the two signals, causing both of them to display stop indications.

The line relay was removed from the westbound signal on the day following the accident and subjected to a series of tests. It was found that when energy was first applied to the operating coils the relay would pick up and drop away in the usual manner, but after the relay had been energized for a period of five or more minutes it would remain in the energized position after the operating energy had been removed, the front contacts remaining closed and causing a proceed indication to be displayed for a period of several minutes. When the operating energy was first removed the vane would recede slowly from its uppermost position until after a considerable period of time it would finally return to its normal stop position. The more frequently the relay was energized the longer it would remain in the clear position after the operating energy had been removed, in fact, after one extended series of tests this condition remained for more than one hour and still existed when the tests for that day were concluded. It was also found that tapping the housing or jarring the relay lightly seemed to have no effect. The relay operated properly at times but in all of the tests in which it failed to operate properly it was noted that it would remain in the proceed position for a short time or until the vane had dropped far enough to open the front contacts. There would then be an interval when the vane would be in a neutral zone and not permit of the displaying of any indication, and finally the vane would drop low enough to close the back contacts and cause the display of a stop indication. This operation of the relay was in entire conformity with the various indications of the signal observed by the employees immediately preceding and following the occurience of the accident. This relay was identified as one which had been overhauled by employees of the company since January of this year, but no opinion can be expressed as to its condition when it was again installed, and the reason for its uncertain

performance on the day of the accident and also during the tests which were afterwards conducted was not definitely ascertained.

Conclusions

This accident was caused by a false clear signal indication, due to a defective relay.

The evidence disclosed that the line relay at the westbound signal was in defective condition, as a result of which the relay would hold the signal in the proceed position for an indefinite period of time after the removal of the operating energy. There would then be an interval during which it would be in a neutral position resulting in no signal indication being displayed, and finally the back contacts would be closed and cause the signal governed by the relay to assume the stop position.

Under the special instructions contained in the time table the speed of trains over this guantlet track is restricted to 15 miles an hour. The evidence indicated that neither of the motormen involved in this accident was observing this rule. Had the rule been observed it is believed the trains could have been brought to a stop before the accident occurred.

Had an adequate system of automatic train control been in use this accident would not have occurred.

The employees involved were experienced men; at the time of the accident they had been on duty about 7 hours, after 13 hours or more off duty.

Respectfully submitted,

W. P. BORLAND.

Director.