INTERSTATE COMMERCE COMMISSION.

WASHINGTON

INVESTIGATION NO. 2960

THE PENNSYLVANIA RAILROAD COMPANY

REPORT IN RE ACCIDENT

NEAR HARRISON, N. J., ON

DECEMBER 17, 1945

SUMMARY

Railroad:	Pennsylvania
Date:	December 17, 1945
Location:	Harrison, N. J.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	065
Engine number:	MU 1934
Consist:	7 cars
Estimated speed:	12 m. p. h.
Operation:	Signal indications; interlocking
Track:	Double; tangent; 0.50 percent descending grade westward
Weather:	Cloudy
Time:	6:27 p. m.
Casualties:	3 killed; 82 injured
Cause:	Failure to obey interlocking signal indications

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2960

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

THE PENNSYLVANIA RAILROAD COMPANY

February 6, 1946.

Accident near Harrison, N. J., on December 17, 1945, caused by failure to obey interlocking signal indications.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On December 17, 1945, there was a derailment of a passenger train on the Pennsylvania Railroad near Harrison, N. J., which resulted in the death of 1 passenger and 2 employees, and the injury of 79 passengers and 3 employees. This accident was investigated in conjunction with a representative of the New Jersey Board of Public Utility Commissioners.

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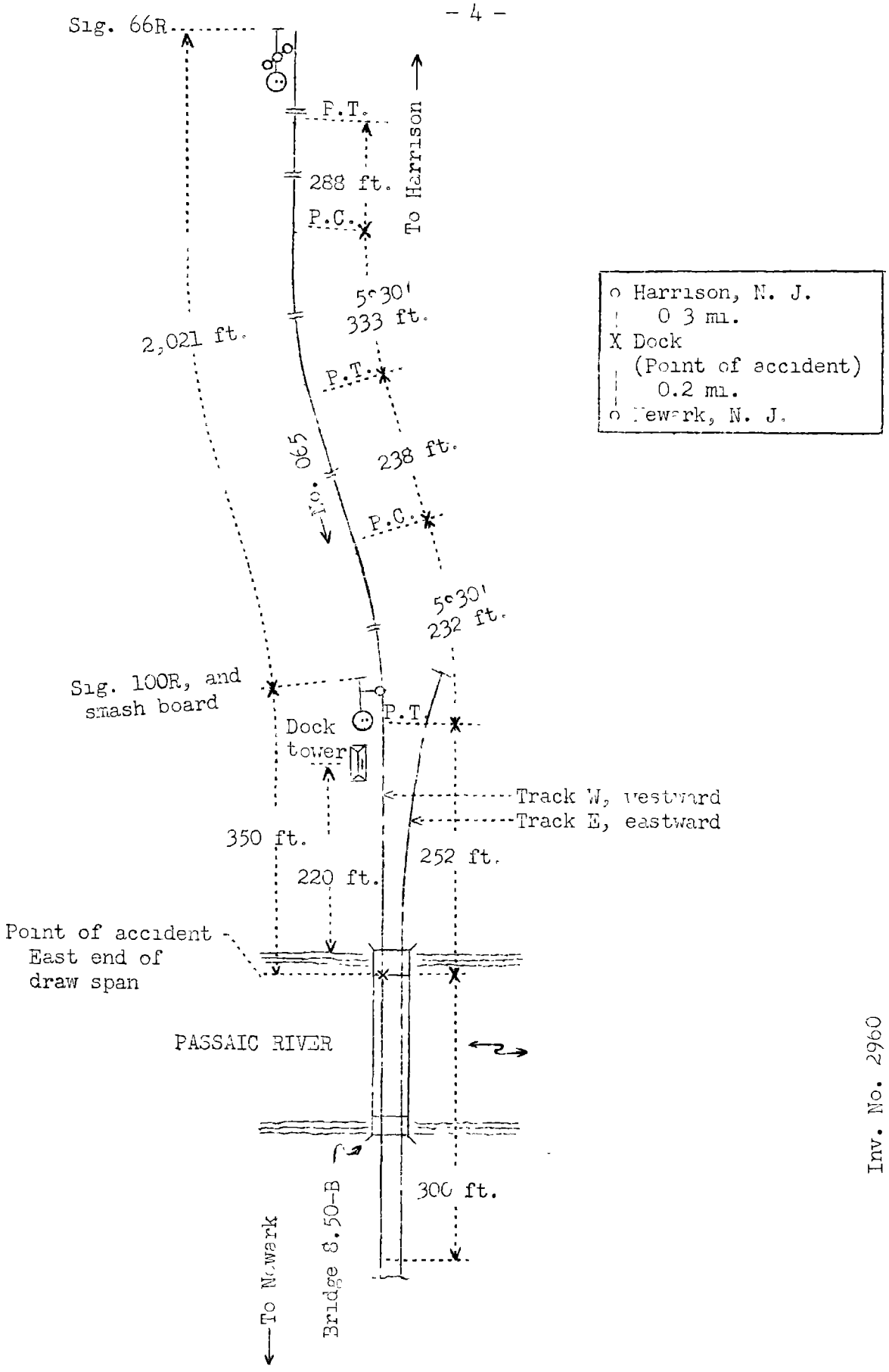
[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 2960
Pennsylvania Railroad
Harrison, N. J.
December 17, 1945

Location of Accident and Method of Operation

This accident occurred on that part of the New York Division extending between Harrison and Newark, N. J., 0.5 mile. Within interlocking limits at Dock, 0.3 mile west of Harrison, the tracks of a double-track line, designated from north to south as track W, westward main track, and track E, eastward main track, cross the Passaic River over Bridge 8.50-B. The line is equipped with power rails for the electric propulsion of trains. Trains moving with the current of traffic are operated by signal indications. The accident occurred on track W at the east end of the draw-span of Bridge 8.50-B. From the east on track W there are, in succession, a tangent 288 feet, a 5°30' curve to the left 333 feet, a tangent 238 feet, a 5°30' curve to the right 232 feet and a tangent 252 feet to the point of accident and about 300 feet westward. The grade for westbound trains is 4.0 percent ascending 730 feet, then it is 0.50 percent descending 695 feet to the point of accident.

The railroad crosses the river at approximately right angles. The draw-span of Bridge 8.50-B is of the double-track, steel, through-truss, vertical-lift type, and is 237 feet long. It has a maximum lift of 135 feet, and is electrically operated. The structure of the span extends about 25 feet below the level of the tops of the rails. The interlocking and the bridge mechanism are controlled from the tower at Dock, located 220 feet east of the west end of the draw-span. At the time of the accident the span was being lowered to position for movement on the railroad after it had been raised for the passage of river traffic, and the level of the tops of rails of the span were about 11 feet above the level of the tops of the rails of track W.

Interlocking signals 66R and 100R, governing west-bound movements on track W, are, respectively, 2,371 feet and 350 feet east of the point of accident. These signals are of the position-light type, and are continuously lighted. A smash-board signal is attached to the mast of signal 100R. Engines and motors operating in this territory are provided with cab signals of the four-indication position-light type, and audible warning signals. The involved aspects and corresponding indications and names of these signals are as follows:

Signal	Aspect	Indication	Name
66R	Three white lights in horizontal position over three white lights in diagonal position to the right	Proceed prepared to stop at next signal. Slow speed within interlocking limits.	Slow-approach.
Cab signal	Three white 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.
100R	Three white lights in horizontal position over smash board in horizontal position	Stop.	Stop-signal.
Cab signal	Two white lights in diagonal position to the left	Proceed at restricted speed.	Restricting.

The interlocking is of the electro-pneumatic type. Approach and indication locking are provided. An illuminated track diagram is provided and is so arranged that, when the lift span is unlocked for raising, red lights are displayed. When the interlocking signals display proceed, green lights are displayed on the track diagram, and track occupancy is indicated by amber lights. The controlling circuits are so arranged that signal 100R and the smash-board signal must display stop before the mechanism of Bridge 8.50-E can be unlocked to raise the lift-span. The lift-span must be locked in position for movement over the bridge before the levers in control of signal 100R and the smash-board can be placed in position for these signals to display proceed. When the route is lined for west-bound movement on track W and signal 100R is displaying stop, signal 66R displays proceed-prepared-to-stop-at-next-signal, if the block is unoccupied. When signal 66R displays proceed-prepared-to-stop-at-next-signal, the cab signal of a west-bound train passing the signal displays proceed-at-restricted-speed until the front of the train passes a point about 200 feet west of signal 66R, then, if signal 100R is displaying stop and the block is unoccupied, the cab signal will display proceed-prepared-to-stop-at-next-signal. If a west-bound train passes signal 100R when it is displaying stop, the cab signal will then display proceed-at-restricted-speed. The audible warning signal will sound when a cab signal displays an indication other than proceed and will continue to sound until an acknowledging lever in the control compartment of an engine or motor is placed in acknowledging position.

The smash-board signal on the mast of signal 100R is 7 feet 3 inches long and is equipped with a lattice disc 23-1/2 inches in diameter. When the smash-board is in horizontal position, the disc is 8 feet 10-1/2 inches above the level of the tops of the rails and extends about 1 foot south of the gage side of the north rail.

Operating rules read in part as follows:

DEFINITIONS

* * *

Cab Signal--A signal located in engineman's compartment or cab indicating a condition affecting the movement of a train or engine.

* * *

Speeds

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

* * *

Slow Speed--Not exceeding 15 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.

98. Trains must approach * * * drawbridges, prepared to stop unless * * * signals indicate proceed, and track is clear. * * *

296. Cab signal indications do not supersede fixed signal indications except when cab signal changes to a more restrictive or a more favorable indication after passing a fixed signal.

298. Should cab signal and fixed signal indications conflict, the more restrictive indication will govern.

663. A train or engine must stop clear of an interlocking signal indicating "stop." A train or engine must not pass a Stop-Signal except when authorized by Clearance Card * * * or train order. * * *

The maximum authorized speed for the train involved was 30 miles per hour.

Description of Accident

No. 065, a west-bound first-class passenger train, consisted of seven multiple-unit coaches. All cars were of steel construction. This train was operated from the front control compartment of MU coach 1934, the front unit of the train. This train passed signal 66R, which displayed proceed-prepared-to-stop-at-next-signal, stopped at the station at Harrison, and departed about 6:25 p. m., 7 minutes late, passed signal 100R, which displayed stop, and while moving at an estimated speed of 12 miles per hour it struck the east end of the lift-span of Bridge 8.50-B, and was derailed.

The front truck of the second car and one wheel of the front truck of the third car were derailed. The front and rear ends of the body of the first car stopped, respectively, 7 feet and 5 feet 4 inches above the level of the rails, and the front end of the body of the second car stopped 6 feet 8 inches above this level. The front control compartment and the rear end of the first car and the front end of the second car were badly damaged.

The weather was cloudy at the time of the accident, which occurred about 6:27 p. m.

The motorman was killed, and the conductor was injured.

The MU cars involved are equipped with electro-pneumatic and automatic air brakes. A safety-control feature actuated by a contact plunger on the controller handle is provided. If pressure on this handle is released, the train brakes will become applied in emergency unless a full-service brake-pipe reduction has been made. The electro-pneumatic and the automatic features of the train-brake system are operated by one brake valve. To apply manually the brakes in emergency, the brake valve must be moved to the extreme right of the brake valve quadrant.

Discussion

About 6:23 p. m. the operator at Dock tower placed the control levers of the mechanism of Bridge 8.50-B in position for the lift-span to rise to permit the passage of river traffic. At this time signal 66R displayed proceed-prepared-to-stop-at-next-signal, signal 100R displayed stop, the smash-board was in horizontal position and the lights of the track diagram in the tower indicated that no train was occupying track W in the block immediately west of signal 100R. About 6:27 p. m., after the operator had placed the control levers of the mechanism of the bridge in position for the lift-span to be lowered,

the lift-span was in downward motion and was about 11 feet above seating and locking position for movement on the railroad when the east end was struck by No. 065.

The stop indication displayed by signal 100R required No. 065 to stop short of that signal and not to proceed until an indication permitting the train to proceed was displayed or proper authority from the operator had been received. It could not be determined why the motorman of No. 065 failed to take action to stop the train in compliance with the stop indication displayed by signal 100R, as he was killed in the accident. The members of the train crew said that the train was proceeding normally as it approached the bridge, and the first they were aware of anything being wrong was when the brakes were applied in emergency about 2 seconds prior to the collision. Examination after the accident disclosed that the brake valve was in emergency position and the controller was in closed position. The brakes of this train had been tested and had functioned properly en route. Some time after the accident during a test conducted on a train similar to No. 065, an emergency application was made at the smash-board when the train was moving about 17 miles per hour, and a stop was made in 95 feet, or 255 feet short of the lift-span.

Visual tests made after the accident disclosed that aspects displayed by signal 100R could be seen throughout a distance of about 2,000 feet immediately east of the signal. The controlling circuits of the interlocking are so arranged that unless the lift-span of Bridge 8.50-B is locked in position for movement on the railroad, signal 100R displays stop. In tests after the accident the interlocking functioned properly.

Cause

It is found that this accident was caused by failure to obey interlocking signal indications.

Dated at Washington, D. C., this sixth day of February, 1946.

By the Commission, Commissioner Patterson.

W. P. BARTEL,
Secretary.

(SEAL)