

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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INVESTIGATION NO. 2549  
THE BALTIMORE & OHIO CHICAGO  
TERMINAL RAILROAD COMPANY  
REPORT IN RE ACCIDENT  
AT INDIANA HARBOR, IND., ON  
DECEMBER 2, 1941

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## SUMMARY

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Railroad: Baltimore & Ohio Chicago Terminal  
Date: December 2, 1941  
Location: Indiana Harbor, Ind.  
Kind of accident: Derailment  
Train involved: Passenger  
Train number: 8  
Engine number: Diesel-electric engine 57  
Consist: 13 cars  
Speed: 30 m.p.h.  
Operation: Timetable, train orders and an  
automatic block-signal system;  
interlocking  
Track: Double; tangent; 0.1 percent  
ascending grade eastward  
Weather: Misty  
Time: About 10:58 p.m.  
Casualties: 1 killed; 2 injured  
Cause: Accident caused by failure to  
operate passenger train in  
accordance with interlocking  
signal indications

INTERSTATE COMMERCE COMMISSION

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INVESTIGATION NO. 2549

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

THE BALTIMORE & OHIO CHICAGO TERMINAL RAILROAD COMPANY

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January 28, 1942.

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Accident at Indiana Harbor, Ind., on December 2, 1941, caused  
by failure to operate passenger train in accordance  
with interlocking signal indications.

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REPORT OF THE COMMISSION<sup>1</sup>

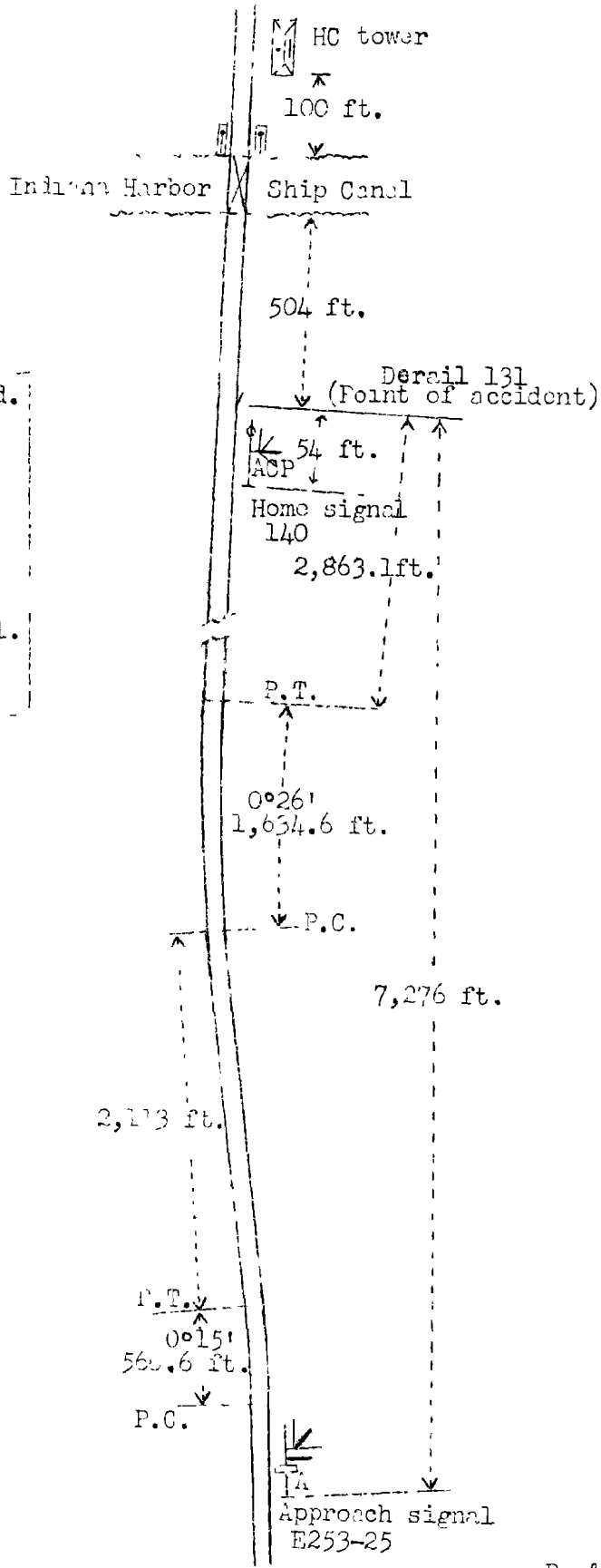
PATTERSON, Commissioner:

On December 2, 1941, there was a derailment of a Baltimore & Ohio Railroad passenger train on the line of the Baltimore & Ohio Chicago Terminal Railroad at Indiana Harbor, Ind., which resulted in the death of one employee and the injury of one railway mail clerk and one employee. This accident was investigated in conjunction with representatives of the Public Service Commission of Indiana.

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<sup>1</sup>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.



- Pine Junction, Ind. 2.4 mi.
- Indiana Harbor 0.7 mi.
- X Point of accident 2.5 mi.
- Whiting, Ind. 4.4 mi.
- South Chicago, Ill. 19.4 mi.
- Chicago, Ill.



Inv-2549  
B. & O. C. T. R. R.,  
Indiana Harbor, Ind.,  
December 2, 1941.

Location of Accident and Method of Operation

This accident occurred on that part of the Baltimore & Ohio Chicago Terminal Railroad, hereinafter referred to as the B. & O.C.T., which extends between Rock Island Jct., South Chicago, Ill., and Pine Jct., Ind., a distance of 9.7 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. At a point 0.7 mile west of the station at Indiana Harbor a draw-bridge spans Indiana Harbor Ship Canal. The accident occurred within interlocking limits on the eastward main track at a split switch-point derail, located on the south rail 504 feet west of the west abutment of the bridge. As the point of accident is approached from the west there is a  $0^{\circ}26'$  curve to the right 1,634.6 feet in length, which is followed by a tangent 2,863.1 feet to the point of accident and 504 feet beyond. The grade for east-bound trains is 0.1 percent ascending at the point of accident.

In the vicinity of the point of accident the canal is spanned by five drawbridges. These drawbridges are controlled from HC tower, located 100 feet east of the canal and 25 feet south of the eastward main track of the B. & O.C.T. The bridge involved is protected by an interlocking, which is maintained and operated by the New York Central Railroad. On the B. & O.C.T., the drawbridge is of the double-track, single-leaf, bascule type. The fixed end is on the east abutment. The distance from the west backwall to the east backwall is 88.5 feet. The bridge is operated by electric power. At the time of the accident the bridge was open for passage of a ship through the canal. At the bridge the water line was approximately 12-1/2 feet below the top of the rail, and the water was approximately 24 feet deep.

The interlocking machine is of the electric type, and consists of 113 working levers in a 144-lever frame. On the B. & O.C.T., time locking and electric switch locking are provided. The time release for the eastward main track is set for 3 minutes 35 seconds. The bridge involved is equipped with bridge locks and rail locks operated electrically and controlled from HC tower. These bridge locks and rail locks are locked by means of locks controlled by levers in the interlocking machine. The bridge motor-control lever is provided with a circuit breaker.

Approach signal E253-25 and home signal 140, governing east-bound movements on the eastward main track, and derail 131 are located, respectively, 7,276, 558, and 504 feet west of the west abutment of the bridge involved. Signal E253-25 is of the automatic, 3-indication, 2-arm, upper-quadrant,

semaphore type, and is approach lighted. Signal 140 is of the semi-automatic, 4-indication, color-position-light type, and is approach lighted. The involved night aspects and corresponding indications and names of these signals are as follows:

<u>Signal No.</u>	<u>Night Aspect</u>	<u>Indication</u>	<u>Name</u>
E253-25	Yellow over red, staggered	Proceed preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed.	Approach
140	Two red lights in horizontal position	Stop	Stop

When an east-bound train reaches a point 5,277 feet west of signal E253-25, this signal becomes lighted, and when it reaches a point 7,222 feet west of signal 140, this signal becomes lighted. The interlocking is so arranged that the bridge cannot be raised unless the levers of all signals governing movements over the bridge are in normal position, the home signals display stop, derails are set for derailing, the rail locks and the bridge locks are unlocked, and the circuit breaker is closed. If any lever is in improper position, the circuit breaker cannot be closed nor the bridge raised. When the draw span is in position for the passage of a ship, the levers controlling the routes on the railroad are locked.

Operating rules read in part as follows:

SPEED RESTRICTIONS

NORMAL SPEED--The maximum speed permitted by timetables for main track movements.

MEDIUM SPEED--One-half the normal speed, not to exceed thirty (30) miles per hour.

34. All members of train and engine crews will, when practicable, communicate to each other by its name the indication of each signal affecting the movement of their train or engine.

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

949A. The duties of the fireman-helper on Diesel locomotives will consist of \* \* \*, observe everything in general in engine rooms, \* \* \*.

\* \* \* Also observe signals at such points as instructed by the Road Foreman. Signal and train observance can be made from the window in the engine room. \* \* \*.

In the vicinity of the point of accident the maximum authorized speed for passenger trains is 65 miles per hour, and on the bridge involved, 40 miles per hour.

#### Description of Accident

No. 8, an east-bound first-class B. & O. passenger train, consisted of Diesel-electric engine 57, of the two-unit type, one mail car, two baggage cars, one passenger-baggage car, three coaches, one Pullman sleeping car, one Pullman club car, and four Pullman sleeping cars, in the order named. All cars were of steel construction. After a terminal air-brake test was made, this train departed from Grand Central Station, Chicago, 27.0 miles west of Indiana Harbor, at 10:04 p.m., according to the dispatcher's record of movement of trains, 4 minutes late. Soon afterward a running test of the brakes was made, and the brakes functioned properly at all points where used en route. This train stopped at South Chicago, 6.9 miles west of the point of accident, passed Whiting, 2.5 miles west of the point of accident and the last open office, at 10:54 p.m., 7 minutes late, passed signal E253-25, which was displaying approach, at a speed of 66 miles per hour, as indicated by the tape of the speed recorder with which the engine was equipped, passed signal 140, which was displaying stop, and while it was moving at a speed of about 30 miles per hour the two units of the engine and the first five cars were derailed at derail 131. The train continued on the ties and had nearly stopped when the engine reached the west abutment of the bridge, but the front end of the first or "A" unit of the engine dropped into the canal. The first marks of derailment were flange marks beginning at a point 18 feet 3 inches east of derail 131 and continuing to the west abutment of the bridge. These marks were about 6 inches inside the gage side of the north rail and outside the south rail on the tieplates. Apparently the motor housings of the engine units prevented the wheels from being diverted a greater distance from the rails.

The "A" unit of engine 57 was detached from the "B" unit and stopped with its front end in the canal at a point 546

feet east of derail 131. The rear truck stopped on the west abutment and the body of the unit inclined downward at an angle of about 45 degrees. About 28 feet of the forward portion was submerged. The glass in the windshield and in both side windows was shattered. The "B" unit of the engine and the first five cars, remaining coupled, were derailed to the right but stopped upright and in line with the track. The front truck of the sixth car was derailed.

After the occurrence of the accident, inspection of engine 57 disclosed that the throttle was in idling position, the reverse lever in position for forward motion, the independent brake valve in release position and the automatic brake valve in first lap position.

From the engine of an east-bound train the view of the approach signal is unrestricted throughout a distance of more than 1 mile, and of signal 140, throughout a distance of 3,500 feet. Mist restricted visibility slightly at the time of the accident, which occurred about 10:58 p.m.

The employee killed was the engineer and the employee injured was the fireman-helper.

#### Interlocking Data

Tests of the interlocking made after the accident disclosed that the signals functioned as intended.

#### Mechanical Data

Diesel-electric locomotive 57 is provided with HSC brake equipment. A safety control feature, actuated by either a foot diaphragm valve or the automatic brake-valve handle, is provided. If an engineer releases pressure from both the brake-valve handle and the foot valve, a service application of the train brakes will occur and the Diesel engines will operate in idling position.

During the 30-day period preceding the day of the accident there was an average daily movement of 38.3 trains and 19.8 ships at the bridge involved.

#### Discussion

The drawbridge involved is protected by an interlocking, which is so arranged that when the draw span is open the approach signals will display approach, the home signals will display stop, and the derails will be in position for derailling. The rules governing operation on the line involved provide that all trains must approach drawbridges and be



prepared to stop unless the signals indicate proceed and the way is clear, and that a train receiving an approach indication at the approach signal involved must at once reduce to medium speed and be prepared to stop short of the home signal. Medium speed for the train involved was a speed not exceeding 30 miles per hour.

About 10:32 p.m. a ship sounded the signal for passage southward on the canal. On the B. & O.C.T. the home signals displayed stop, and the signalman opened the derails, unlocked the bridge locks and raised the draw span. It was necessary to open four other draw spans and the signalman was fully occupied for some time. After the last draw span was raised the ship started through the canal and, about the same time, the annunciator gave information that No. 8 was in the approach circuit on the eastward main track. Just after the ship cleared the B. & O.C.T. bridge the signalman observed that No. 8 had passed the home signal and immediately afterward the first unit of the Diesel-electric engine dropped into the canal.

According to the tape of the speed recorder with which engine 57 was equipped, the speed of No. 8 was 66 miles per hour at the approach signal, 65 miles per hour 1/2 mile west of the point of accident, 50 miles per hour 1/4 mile west of the point of accident, and then it gradually decreased to 30 miles per hour at the derail. A special agent and an operator who saw the accident thought the train would be stopped before it reached the bridge, but the front end of the first unit of the engine hung over the abutment momentarily and then plunged into the water. The fireman-helper, who was in the engine room of the first unit, did not observe any application of the brakes prior to the derailment, and after the derailment he could not tell whether the brakes were applied, but he said the speed gradually decreased until the first unit dropped into the canal. The Diesel-engine maintainer and the baggageman thought a light service application of the brakes occurred when the first unit was about the location of the derail, then soon afterward the brakes became applied in emergency. The brakeman said that when No. 8 was approaching the point where the accident occurred he was in the fifth car. He felt several surges, and, realizing that something was wrong, he opened the conductor's emergency valve. It is probable these surges occurred after the engine was derailed. The conductor said that it was customary for the engineer to allow the train to drift in order to comply with the speed restriction of 40 miles per hour at the bridge. On the night of the accident, however, the brakes were applied in emergency when the speed was 40 or 45 miles per hour, and the train stopped in about 1,000 or 1,200 feet. Investigation after the accident dis-

closed that the throttle was in idling position and the automatic brake valve was in first lap position; however, the road foreman of engines said that no particular significance could be attached to the position of the brake valve as it could have been moved during the process of removing the body of the engineer. The brakes had been tested, and they functioned properly at all points where used en route. During tests made after the accident the signals involved functioned as intended.

The engineer involved was considered by the officials as being capable, and particularly careful in the observance of signal indications. An autopsy was performed, as a result of which the company surgeon stated that the engineer suffered a cerebral hemorrhage, and although he was unable to state the exact time at which the hemorrhage occurred it was reasonable to suppose that it occurred prior to the derailment. No member of the crew saw the engineer after the train left South Chicago. The train stopped at South Chicago in the usual manner, the movement from this station to the approach signal involved was normal, and the speed of the train was being reduced in compliance with the speed restriction at the bridge but not in compliance with signal indications. These facts indicate that if the engineer was incapacitated before the occurrence of the accident the disability occurred only a short time before the train was derailed.

The rules require all members of an engine crew to communicate to each other, when practicable, the indication of each signal affecting the movement of their train or engine; however, the investigation indicated that the fireman-helper of a Diesel-electric engine is required to spend about 85 percent of his time on each trip in touring both units to check the performance of the engines and the steam-heat boiler. During his tours through the two units, the fireman-helper can observe signal indications from the side windows of either unit, but when the engines are operating at maximum capacity he is required to maintain continuous observance of the engine performance. A Diesel-engine maintainer is assigned to duty on Diesel-electric engines for the purpose of supervising the fireman-helper's duties, and, in addition, to make necessary repairs. If the fireman-helper had been in the control compartment as the train was approaching Indiana Harbor Ship Canal, he could have observed that No. 8 was not being operated in accordance with signal indications and could have taken action to avert the accident.

Cause

It is found that this accident was caused by failure to operate a passenger train in accordance with interlocking signal indications.

Dated at Washington, D. C., this twenty-eighth day of January, 1942.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.