INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 3244

INDIANA HARBOR BELT RAILROAD COMPANY

REPORT IN RE ACCIDENT

NEAR CALUMET CITY, ILL., ON

APRIL 8, 1949

SUMMARY

Date:	April 8, 1949	
Railroad:	Indiana Harbor Belt	
Location:	Calumet City, Ill.	
Kind of accident:	Rear-end collision	
Trains involved:	Freight	: Freight
Train numbers:	Extra 255 East	: Extra 7113 East
Engine numbers:	255	: Diesel-electric unit 7113
Consists:	67 cars, caboose	: 10 cars, caboose
Estimated speeds:	Standing	: 20 m. p. h.
Operations:	Signal indications	
Tracks:	Three; tangent; level	
Weather:	Clear	
Time:	4:42 a. m.	
Casualties:	1 killed; 2 injured	
Cause:	Failure to operate following train in accordance with signal indication	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3244

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

INDIANA HARBOR BELT RAILROAD COMPANY

June 10, 1949

Accident near Calumet City, Ill., on April 8, 1949, caused by failure to operate the following train in accordance with a signal indication.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On April 8, 1949, there was a rear-end collision between two freight trains on the Indiana Harbor Belt Railroad near Calumet City, Ill., which resulted in the death of one train-service employee, and the injury of two train-service employees.

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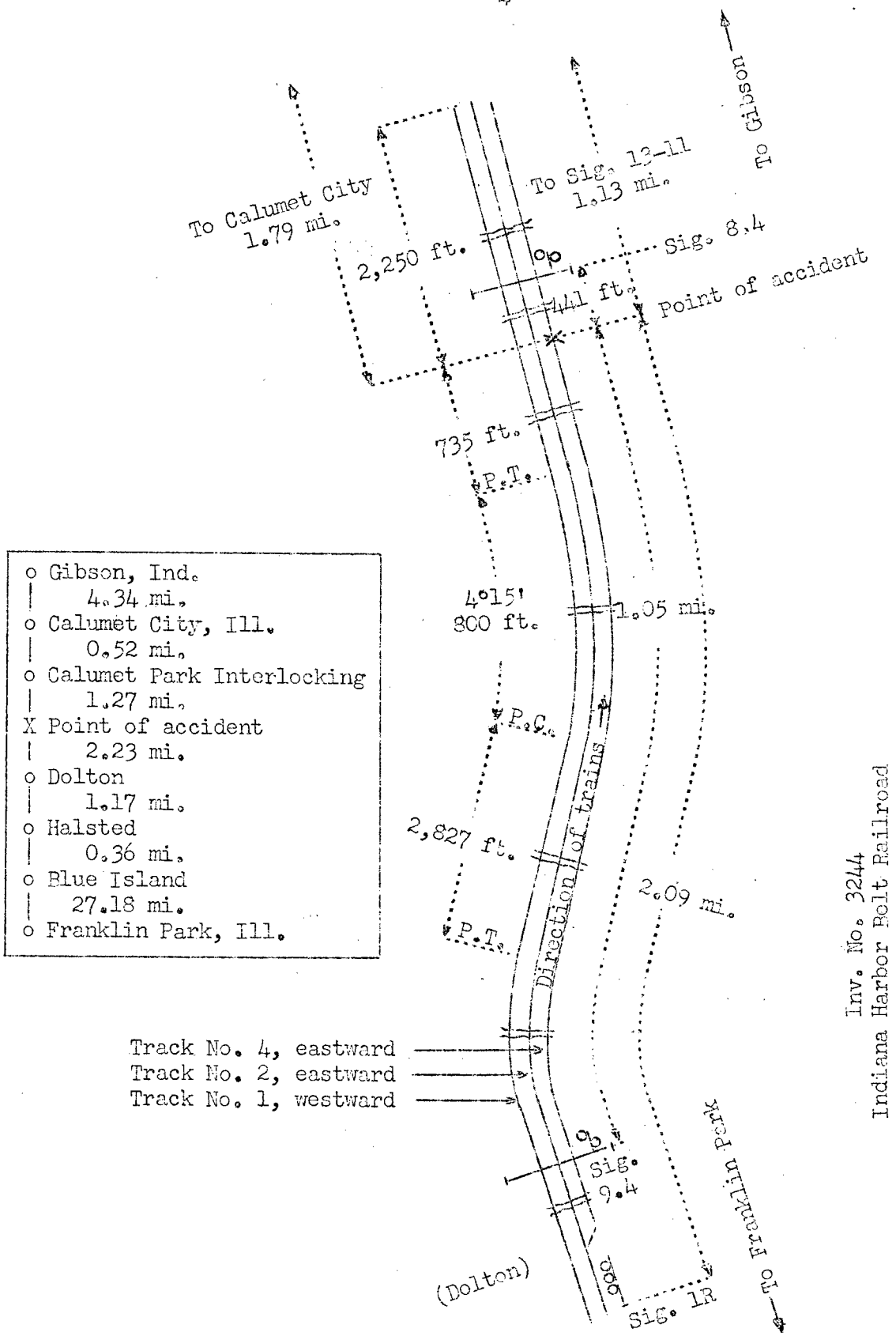
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 3244
Indiana Harbor Belt Railroad
Calumet City, Ill.
April 8, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the railroad extending between Franklin Park, Ill., and Gibson, Ind., 37.07 miles. In the vicinity of the point of accident this is a three-track line, over which trains moving with the current of traffic are operated by signal indications. The main tracks from south to north are designated as No. 4, eastward; No. 2, eastward; and No. 1, westward. Track No. 4 extends from Dolton to Calumet Park, respectively, 2.23 miles west and 1.27 miles east of the point of accident. The accident occurred on track No. 4 at a point 30.94 miles east of Franklin Park, and 1.79 miles west of Calumet City. From the west there are, in succession, a tangent 2,827 feet in length, a 4°15' curve to the left 800 feet, and a tangent 735 feet to the point of accident and 2,250 feet eastward. The grade is level.

Interlocking signal 13-11, governing east-bound movements through Calumet Park interlocking, is located 1.13 miles east of the point of accident. Interlocking signal 1R, governing east-bound movements from track No. 2 to track No. 4 at Dolton, and automatic signal 9.4, governing east-bound movements on track No. 4, are located, respectively, 2.09 miles and 1.05 miles west of the point of accident. Signal 1R is a three-unit color-light signal, which can display six aspects. Signal 9.4 is a two-unit color-light signal, which can display three aspects. These signals are approach lighted. The involved aspects and corresponding indications are as follows:

Signal	Aspect	Indication
1R	Red-over-red-over-yellow	Proceed at restricted speed
9.4	Red-over-yellow, staggered	Proceed at restricted speed.

The controlling circuit of each of these signals is so arranged that when the block of that signal is occupied the signal will display an aspect indicating proceed-at-restricted-speed.

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

14. Engine Whistle Signals.

Note.--The signals prescribed are illustrated by "o" for short sounds; "__" for longer sounds. * * *

Sound.	Indication.
* * *	
(g) o o	Answer to any signal not otherwise provided for.
* * *	

29. When a signal, except a fixed signal, is given to stop a train, it must, unless otherwise provided, be acknowledged as prescribed by Rule 14 (g) * * *.

34. The engineman and fireman must * * * communicate to each other the indication of all signals affecting the movement of their train.

35. The following signals will be used by flagmen:

* * * Night signals--A red light,
A white light,
Torpedoes,
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. When recalled and safety to the train will permit, he may return.

When the conditions require, he will leave the torpedoes and a lighted fusee.

* * *

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.

SIGNAL DEFINITIONS.

* * *

Slow Speed.--A speed not exceeding fifteen miles per hour.

Restricted Speed.--A speed not exceeding that which will enable a train to stop short of train ahead, obstruction, or switch not properly lined, look out for broken rail, and not exceeding slow speed.

* * *

505. Block signals govern the use of the blocks, but, unless otherwise provided, do not * * * dispense with the use or the observance of other signals whenever and wherever they may be required.

ENGINEMEN.

928. They must, if anything withdraws attention from constant lookout ahead, * * * at once so regulate speed as to make train progress entirely safe.

FIREMEN.

943. If engineman fails to regulate speed of train when approaching a signal indication or other condition requiring that speed be reduced, they must communicate with him at once, and, if necessary, stop the train.

The maximum authorized speed for the trains involved was 40 miles per hour.

Description of Accident

Extra 255 East, an east-bound freight train, consisted of engine 255, 67 cars and a caboose. This train entered track No. 2 at Halsted, the last open office, 5.19 miles west of Calumet City, at 4:16 a. m., entered track No. 4 at Dolton, and stopped with the caboose standing 1.05 miles east of signal 9.4, and 1.79 miles west of Calumet City. About 4 minutes later the rear end was struck by Extra 7113 East.

Extra 7113 East, an east-bound freight train, consisted of Diesel-electric unit 7113, 10 cars and a caboose. This train entered track No. 2 at Halsted at 4:26 a. m., passed signal 1R, which displayed an aspect indicating Proceed-at-restricted-speed, entered track No. 4 at Dolton, passed signal 9.4, which also displayed an aspect indicating Proceed-at-restricted-speed, and while moving at an estimated speed of 20 miles per hour it struck the rear end of Extra 255 East.

The force of the impact moved Extra 255 East a distance of about 6 feet eastward. The caboose of Extra 255 East was constructed with wooden superstructure and a steel underframe. It was demolished. The rear end of the sixty-seventh car stopped on top of Diesel-electric unit 7113. This car was destroyed. The sixty-sixth car was somewhat damaged.

The front end of the Diesel-electric unit of Extra 7113 East stopped 66.5 feet east of the point of collision. The front truck was derailed. The front end was destroyed, the main frame was buckled, the Diesel engine was shifted on the bed plate, and the control compartment was shifted and considerably damaged.

The conductor of Extra 255 East was killed. The engineer and the front brakeman of Extra 7113 East were injured.

The weather was clear at the time of the accident, which occurred at 4:42 a. m.

Diesel-electric unit 7113 is a 0-4-4-0 road-switcher type. It was manufactured during July, 1948. The accumulated mileage was 33,138 miles, and no major repairs had been made prior to the accident. The last trip inspection prior to the accident was completed at 2 p. m., April 7, 1949. It is provided with type 24-RL brake equipment. The length inside the knuckle faces is 51 feet, the over-all height is 14 feet 6 inches, and the total weight is 250,000 pounds. Each axle is driven by a traction motor mounted on the axles and between companion wheels. Each motor is connected to its axle by a pinion on the armature shafting, which engages a ring gear on the axle. The Diesel engine is a water cooled, 2-cycle, 10-cylinder, 2,000-horsepower unit of the opposed piston type. The control compartment is located at the rear of the unit. The engine compartment is of the same height as the control compartment and approximately 6 feet in width, and extends from the control compartment toward the front end. The engine compartment is divided into three sections.

The Diesel engine is in the middle section. The exhaust from the engine combustion chambers is effected through mufflers, located at the front of the Diesel engine, and thence through the top of the engine compartment to the atmosphere. Ventilation of the control compartment is effected by an air duct 2 feet in length and 4-1/2 inches in diameter located in the upper portion of the wall separating the control compartment from the rear section of the engine compartment. An air compressor, and a motor-operated traction-motor blower, are located in the rear section of the engine compartment. When the Diesel engine is operating, the air intakes of the air compressor and the blower tend to reduce the normal atmospheric pressure in the rear section of the engine compartment. This condition results in a movement of air from the control compartment through the air duct into the engine compartment. The control-compartment heating system, which also forms a part of the ventilating system, utilizes a portion of the water of the engine cooling system in a radiator located to the left and in front of the engineer's station. Air is forced through this radiator by a 10-inch fan, which may be operated at various speeds by the adjustment of a controlling rheostat-switch. Air is taken, in part, from outside the control compartment through a duct with a cross-sectional area of 32 square inches. The duct is provided with a manually-operated damper for controlling the proportion of air taken from the outside. The ventilating system is designed to change the air in the control compartment, approximately 350 cubic feet, every 20 seconds at idling speed, and every 10 seconds at full engine speed.

Discussion

As Extra 255 East was approaching the point where the accident occurred, the enginemen and the front brakeman were on the engine, and the conductor and the flagman were in the caboose. Interlocking signal 13-11, governing east-bound movements through Calumet Park interlocking, indicated Stop. The train stopped about 4:38 a. m., with the engine about 3,000 feet west of the signal, in order to avoid blocking highway traffic moving over a street crossing. Immediately after the train stopped, the flagman proceeded westward to provide protection for the rear of the train. The front brakeman called the operator at Calumet Park for instructions and was informed that the train could be moved through the interlocking promptly. The engineer then sounded the engine-whistle signal for the flagman to return from the rear. The flagman had reached a point about 600 feet west of the caboose when he heard the engine-whistle signal sounded

to recall him to his train. At the same time he observed an east-bound train approaching on track No. 4 at a distance of about 1/2 mile. He said that, because there was nothing to obstruct the view of the point at which he was located from the cab of an approaching engine, he did not consider the use of torpedoes necessary. He gave stop signals with a red lantern and a lighted fusee, but the signals were not acknowledged. He continued to give stop signals until the engine of the train passed him, but there was no apparent reduction in the speed of the train prior to the time the collision occurred.

After entering track No. 2 at Halsted, Extra 7113 East passed through an underpass located 2,900 feet east of Halsted. The overhead clearance of the underpass is 18 feet 3 inches. The deck above is a solid slab 64 feet 8 inches wide and 120 feet long. There are no openings in the deck between the east and the west faces of the structure. The enginemen said that, when the engine was passing through this underpass, fumes from the exhaust of the engine became objectionable, and the windows of the control compartment were closed. The window on the engineer's side was open for a short time as the train was traversing the curve immediately east of signal 9.4, then it again was closed. As the train was approaching the point where the accident occurred the enginemen were in their respective positions in the control compartment of the Diesel-electric unit, and the conductor, the front brakeman, and the flagman were in the caboose. The brakes of this train had been tested at Blue Island, 3.76 miles west of the point where the accident occurred. The independent brake had functioned properly when used en route. The automatic brakes had not been used to control the speed of the train east of Blue Island. The headlight was lighted brightly. The enginemen said they were maintaining a lookout ahead. There was nothing about the engine to distract their attention from their usual duties. The train passed signal 1R and signal 9.4, each of which displayed an aspect indicating Proceed-at-restricting-speed. The enginemen called the indications of these signals, and the train was being operated in accordance with the signal indications. As the train approached the curve to the left located immediately west of the point where the accident occurred, the view of the track ahead from the right side of the control compartment was obscured because of track curvature. The engineer reminded the fireman that the train had entered the block under a Proceed-at-restricted-speed indication, and inquired whether the track ahead was clear. The fireman

replied that it was clear. The fireman was unable to explain why he failed to observe the lighted marker lamps on the caboose of Extra 255 East or the stop signals given by the flagman of that train. The enginemen said that they lost consciousness as the train closely approached the curve and that they were not aware of the location of the preceding train until after the collision occurred. The enginemen were not certain what caused them to lose control of their mental faculties, but they said they suffered from symptoms generally associated with carbon-monoxide gas poisoning. Until the collision occurred the trainmen in the caboose were not aware that the block was occupied by a preceding train. They estimated that the speed of their train was 20 miles per hour at the time of the collision. Examination by an officer of the carrier about 1 hour after the accident occurred disclosed that the automatic brake valve was in emergency position, the independent brake valve was in running position, and the throttle was in "off" position.

After the accident, tests were made by an engineering organization employed by the manufacturer of Diesel-electric unit 7113 to determine the amount of toxic gases within the control compartment of a Diesel-electric unit which may be produced in the process of combustion of fuel oil. Diesel-electric unit 7113 could not be used in these tests because of damage to the unit which occurred as a result of the collision. Therefore, a Diesel-electric unit of the same class and which was equipped with the same type of ventilating system was used. Tests were made of the atmosphere at breathing level in the control compartment of the engine while it was standing in the underpass east of Halsted. During the first test the engine was idling and the side windows were open. During the second test the engine was idling and the side windows were closed, and during the third test the engine was operating at full speed and the side windows were open. During these tests the cab heater was operating, the ventilator was open, and the cab door was closed. A test also was made after the engine passed through the underpass at an estimated speed of 18 miles per hour and while handling a train consisting of 11 cars and a caboose. In the latter test, the side windows were open when the engine was approaching the underpass and they were closed immediately after the engine passed uner it. In these tests, the only toxic gases found to be present in the atmosphere of the control compartment

were carbon monoxide and aldehydes. These gases were found in the test only when the Diesel-electric unit had been standing in the underpass during a period of 12 minutes with the engine throttle fully open. However, the volumes of the gases found were not sufficient to be harmful. Examination of engine 7113 disclosed no defective condition of fuel-oil lines or filters, and the air-supply duct of the cab ventilation system was not obstructed.

Cause

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

Dated at Washington, D. C., this tenth day of June, 1949.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.