INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2876

BOSTON AND MAINE RAILROAD

REPORT IN RE ACCIDENT

NEAR EAST PORTAL, MASS., ON

MARCH 17, 1945

SUMMARY

Railroad:	Boston and Maine
Date:	March 17, 1945
Location:	East Portal, Mass.
Kind of accident:	Rear-end collision
Trains involved:	Light engine : Light engines
Train numbers:	Extra 4212 West : Extra 5005 West
Engine numbers:	Diesel-electric 4212 : Electric 5005, 5002, 5003
Estimated speed:	Standing : 18 m. p. h.
Operation:	Signal indications and automatic train-stop system
Track:	Double; tangent; 0.43 percent ascending grade westward
Weather:	Foggy
Time:	1:20 a. m.
Casualties:	2 injured
Cause:	False clear signal indication, as result of sand on rails
Recommendation:	That the Boston and Maine Railroad provide means which will prevent excessive deposit of sand on rails

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2876

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

BOSTON AND MAINE RAILROAD

April 28, 1945.

Accident near East Portal, Mass., on March 17, 1945, caused by a false clear signal indication, as a result of sand on rails.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On March 17, 1945, there was a rear-end collision between two engines on the Boston and Maine Railroad near East Portal, Mass., which resulted in the injury of two employees. This accident was investigated in conjunction with representatives of the Massachusetts Department of Public Utilities.

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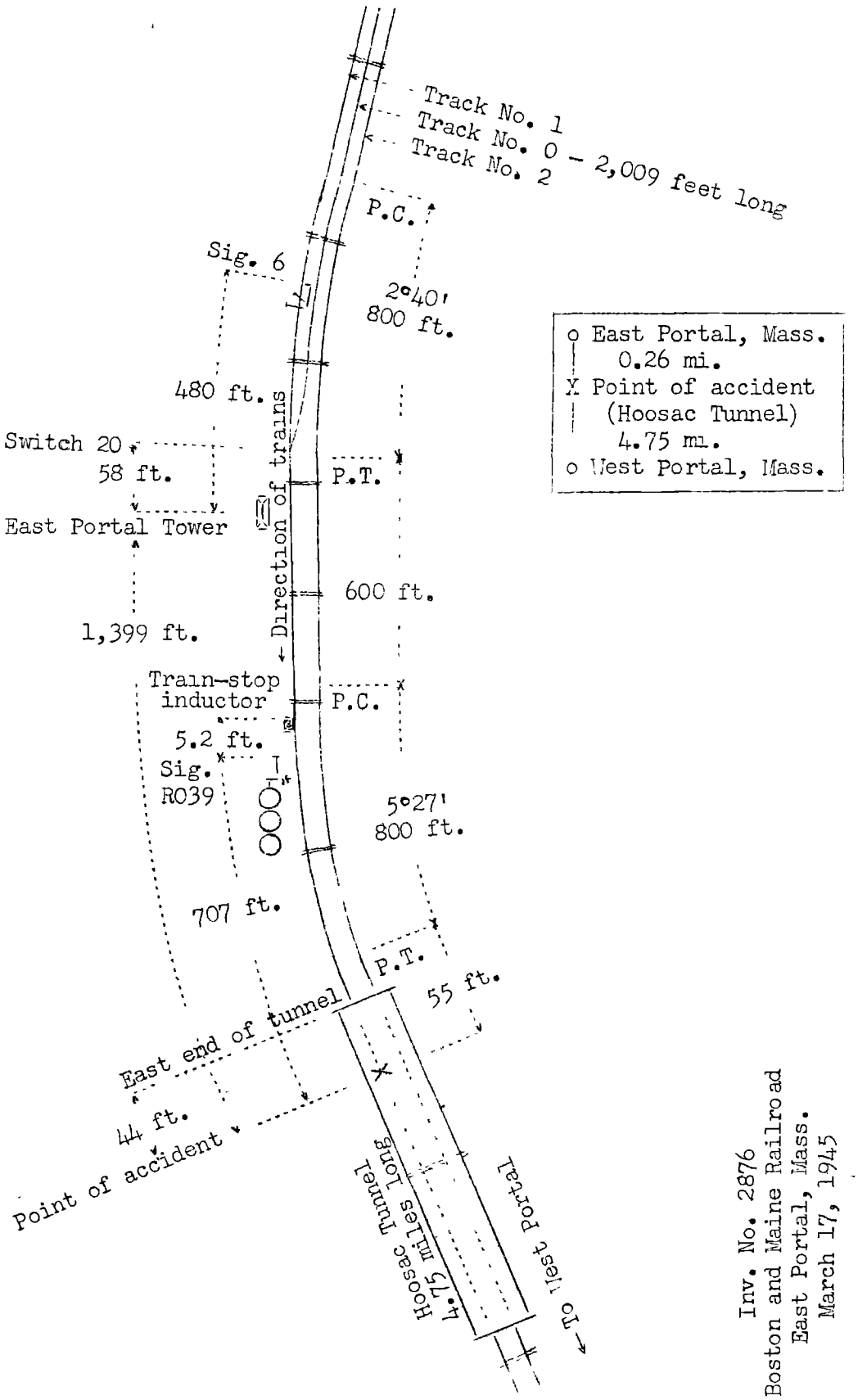
[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 2876
Boston and Maine Railroad
East Portal, Mass.
March 17, 1945

Location of Accident and Method of Operation

This accident occurred on that part of the Fitchburg Division extending westward from East Portal to West Portal, Mass., 5.01 miles, a double-track line equipped with an overhead catenary system for the electric propulsion of trains and extending through Hoosac Tunnel, 4.75 miles in length. The tracks are designated, from north to south, as track No. 1 and track No. 2. Trains are operated in either direction on these tracks by signal indications and an automatic train-stop system. The accident occurred on track No. 1 at a point 44 feet west of the eastern end of Hoosac Tunnel and 1,399 feet west of the tower at East Portal. From the east on track No. 1 there are, in succession, a 2°40' curve to the left 800 feet in length, a tangent 600 feet, a 5°27' curve to the left 800 feet and a tangent 55 feet to the point of accident and a considerable distance westward. The grade is 0.43 percent ascending westward.

Within interlocking limits at East Portal an auxiliary track 2,009 feet long and designated as track No. 0, is between track No. 1 and track No. 2 and parallel to them. Switch 20, which connects the west end of track No. 0 and track No. 1, is 58 feet east of the tower.

Interlocking signal 6, governing west-bound movements from track No. 0 through switch 20 to track No. 1, and interlocking signal 39, governing west-bound movements entering Hoosac Tunnel on track No. 1, are, respectively, 1,879 feet and 707 feet east of the point of accident. Signal 6 is a dwarf signal of the one-arm, lower-quadrant, semaphore type, and signal RO 39 is of the color-light type. The involved night aspects, and corresponding indications and names of these signals are as follows:

Signal	Aspect	Indication	Name
6	Yellow.	Proceed at restricted speed.	----
RO 39	Green-over-red-over-red.	Proceed at normal speed.	Clear.
	Red-over-red-over-red.	Stop.	Stop.

Signals 6 and RO 39, and switch 20 are controlled from the interlocking at East Portal. The controlling circuits of the interlocking are so arranged that, when the route is lined for movement from track No. 0 through switch 20 to track No. 1, signal 6 displays proceed-at-restricted-speed, and when the block immediately west of signal RO 39 is occupied signal RO 39 displays stop. The automatic train-stop system is of the intermittent-inductive type. Engines are provided with acknowledging devices. A train-stop inductor for west-bound movements on

track No. 1 is located 5.2 feet east of signal RO 39. The system is so arranged that when an engine passes an inductor located adjacent to a signal which displays an indication less favorable than proceed an audible warning signal sounds. If the lever which controls the acknowledging device is not moved to acknowledging position within 6 seconds after the audible warning signal begins to sound, an automatic-brake application is initiated. An interval of at least 20 seconds must elapse before release of the brakes and reset of the train-stop apparatus can be obtained.

Operating rules read in part as follows:

DEFINITIONS.

* * *

Restricted Speed.--Proceed prepared to stop short of train, obstruction, or anything that may require the speed of a train to be reduced. The Maximum allowable speed for train or engine operating at Restricted speed is 15 miles per hour.

* * *

34. All members of train and engine crews must, when practicable, communicate to each other by its name 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 and
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.

* * *

Special time-table instructions read in part as follows:

Rule 421.--An audible warning of the train stop equipment indicates a restricted condition of the track ahead and the Engineman must immediately control the speed of his train in accordance with the following conditions:

* * *

(b) If the audible warning is received as the engine is passing a clear wayside signal or when the wayside signal is not visible the train will be brought to a STOP and then proceed at restricted speed to the next wayside signal.

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

Description of Accident

Extra 4212 West, consisting of Diesel-electric engine 4212, of the two-unit type, passed East Portal at 1:15 a. m., passed signal RO 39, which displayed proceed, and stopped on track No. 1 about 1:18 a. m., with the rear end standing 44 feet west of the east end of Hoosac Tunnel. About 2 minutes later the rear end was struck by Extra 5005 West.

Extra 5005 West, consisting of electric engines 5005, 5002 and 5003, in the order named, departed from the west end of track No. 0 at East Portal about 1:17 a. m., passed signal 6, which displayed proceed-at-restricted-speed, entered track No. 1 at switch 20, passed signal RO 39, which displayed proceed, and while moving at an estimated speed of 18 miles per hour it struck Extra 4212 West at a point 707 feet west of signal RO 39.

The rear wheels of the rear truck of the second unit of engine 4212 were derailed. The rear end of the second unit of engine 4212 and the front end of engine 5005 were damaged.

It was foggy at the time of the accident, which occurred about 1:20 a. m.

The engineer and the fireman of Extra 5005 West were injured.

Each unit of engine 4212 has two four-wheel trucks. Sand pipes and traps are located in front of the front wheels of each truck. The flow of sand is actuated by a two-position non-selective positive-flow valve located in the control compartment. The volume of flow is not controlled from the control compartment, but is regulated by pre-adjustment of air-pressure nozzles located in the traps.

Discussion

About 1:12 a. m., the leverman at East Portal placed the lever in control of signal RO 39 in position for this signal to display proceed for Extra 4212 West. Extra 4212 West passed signal RO 39, which displayed proceed, about 1:15 a. m. Then the leverman lined the route for Extra 5005 West to proceed from track No. 0 through switch 20 to track No. 1. Extra 5005 West departed from track No. 0 about 1:17 a. m., passed signal RO 39, which displayed proceed, and struck Extra 4212 West at a point about 700 feet west of signal RO 39. The preceding train had stopped with the rear end standing 44 feet west of the east end of the tunnel, as a result of a brake application initiated by the automatic train-stop system, and was occupying the block immediately west of signal RO 39. The controlling circuits were so arranged that this signal should have displayed stop for Extra 5005 until the preceding train had cleared the block.

The first the enginemen of Extra 5005 were aware of anything being wrong was when they saw the rear end of the preceding train about 100 feet distant. Then the engineer moved the brake valve to emergency position, but the accident occurred before the engines could be stopped. The leverman said that just before Extra 5005 passed signal RO 39 he looked westward and observed that this signal was displaying proceed. However, the first engine of this train passed the signal before he was able to reach the location of the lever to place it in position for the signal to display stop.

The crew of Extra 4212 consisted of an engineer, a fireman and a flagman. When the accident occurred the engineer, the flagman and a fuel supervisor were in the control compartment. The fireman was engaged in duties in the second unit of the engine. Soon after the engine passed signal RO 39, the audible warning signal sounded and the engineer moved the acknowledging lever of the automatic train-stop device to acknowledging position, in an attempt to forestall an automatic brake application. However, the brake application was not forestalled and, when the engine stopped, the flagman was unable to alight from the control compartment to furnish flag protection because there was not sufficient clearance between the engine and the north wall of the tunnel to permit egress from the right door and an east-bound train moving on track No. 2 prevented egress from the left door. The engineer said that, because of moisture on the tops of the rails which resulted from dampness in the tunnel, he opened the sander valve to prevent the wheels of the engine from sliding when the air brakes became applied automatically. In tests after the accident no defective condition was found that would cause an unintended actuation of the automatic train-stop equipment of engine 4212.

Examination immediately after the accident disclosed that there was no defective condition of the automatic block system which contributed to the failure of signal RO 39 to display stop. However, there was an accumulation of sand, crushed to a thickness of about 1/32-inch, on the tops of the rails of track No. 1 in the immediate vicinity of the point where engine 4212 stopped. The signal supervisor said that this accumulation of sand was sufficient to prevent the wheels of the engine from contacting the rails sufficiently to shunt the track circuit.

In tests after the accident the preceding engine involved in the accident, with the sander valve open, was moved westward from the vicinity of signal RO 39 to the point where the accident occurred. The excessive amount of sand which was deposited on the rails during this movement prevented shunting of the track circuit by the wheels of the engine, and signal RO 39 displayed proceed when the engine stopped. In the case in question, evidently sand on the rails resulted in a proceed indication being displayed by this signal when a stop indication was required.

Cause

It is found that this accident was caused by a false clear signal indication, as a result of sand on rails.

Recommendation

It is recommended that the Boston and Maine Railroad provide means which will prevent excessive deposit of sand on rails.

Dated at Washington, D. C., this twenty-eighth day of April, 1945.

By the Commission, Commissioner Patterson.

W. P. BARTEL,
Secretary.

(SEAL)