

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3653
BOSTON AND MAINE RAILROAD
IN RE ACCIDENT
AT LOWELL, MASS., ON
AUGUST 23, 1955

SUMMARY

Date:	August 23, 1955		
Railroad:	Boston and Maine		
Location:	Lowell, Mass.		
Kind of accident:	Collision and derailment		
Equipment involved:	Freight train	: Passenger train	: Yard loco- motive
Train numbers:	Extra 4209 South	325	:
Locomotive numbers:	Diesel- electric units 4209A and 4209B	: Diesel- electric units 4228A and 4228B	: Diesel- electric unit 1123
Consists.	76 cars, caboose	: 13 cars	:
Speeds:	Standing : 60 m. p. h. : Standing		
Operation:	Timetable, train orders, and automatic block-signal system, yard limits		
Tracks	Double, tangent, 0.20 percent descending grade northward		
Weather:	Raining		
Time:	10:48 p. m.		
Casualties:	68 injured		
Cause:	Broken tank-car underframe, and dis- lodged car body and portion of underframe obstructing adjacent main track in front of approaching train		
Recommendation:	That the Boston and Maine Railroad take measures to insure that a car removed from service because of a safety defect is put in proper condition before being returned to service		

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3653

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

BOSTON AND MAINE RAILROAD

October 28, 1955

Accident at Lowell, Mass., on August 23, 1955, caused by a broken tank-car underframe, and by the dislodged car body and a portion of the underframe obstructing an adjacent main track in front of an approaching train.

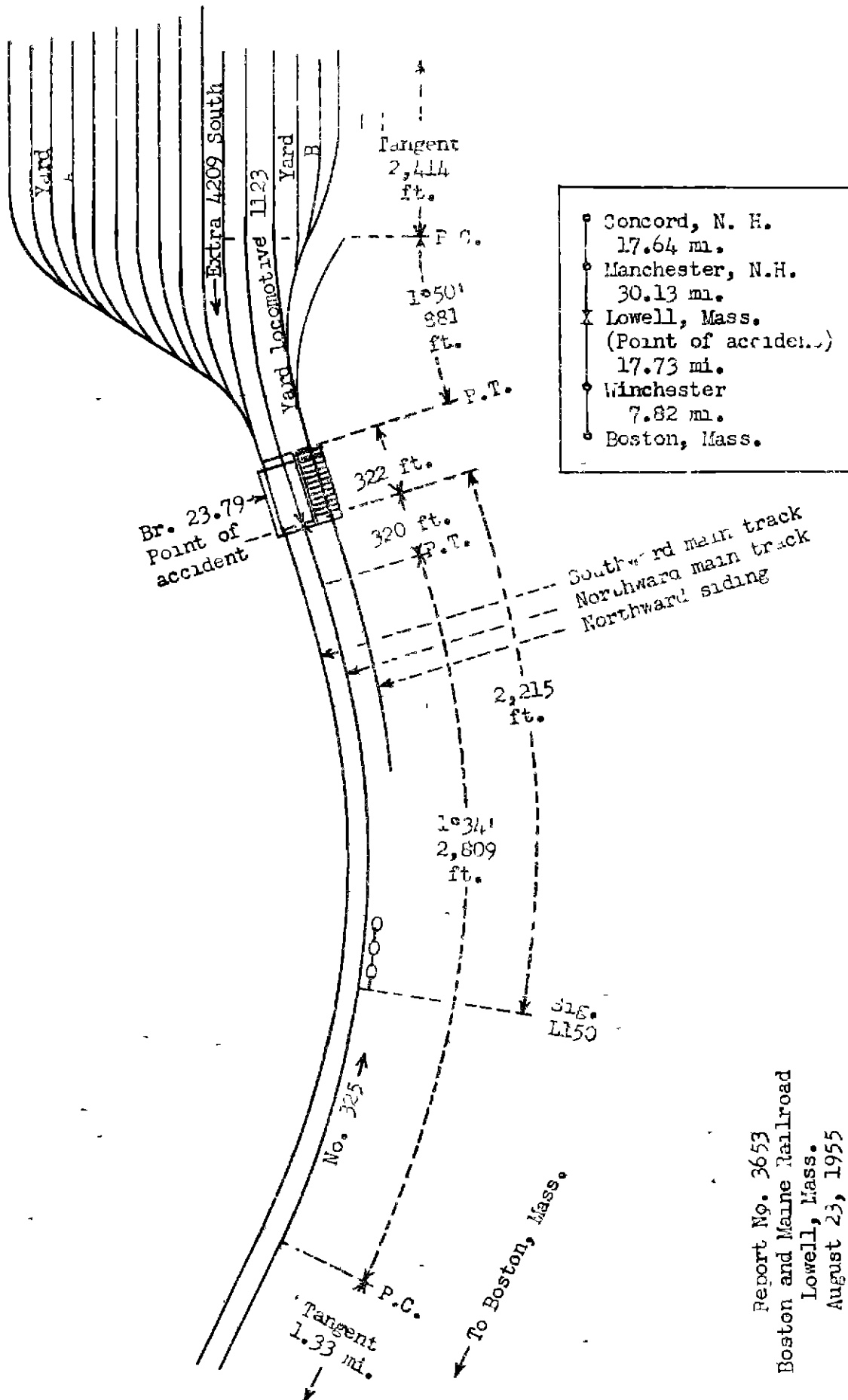
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REPORT OF THE COMMISSION

CLARKE, Commissioner

On August 23, 1955, there was a collision between a passenger train and a portion of a tank car which had been dislodged from a freight train on an adjacent main track on the Boston and Maine Railroad at Lowell, Mass. Derailed equipment of the passenger train struck other equipment of the freight train and a yard locomotive on an adjacent track. This accident resulted in the injury of 53 passengers, 7 railway mail clerks, and 8 train-service employees. The accident was investigated in conjunction with representatives of the Massachusetts Department of Public Utilities.

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Under authority of Section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Clarke for consideration and disposition.

To Concord, N. H. →



Report No. 3653
 Boston and Maine Railroad
 Lowell, Mass.
 August 23, 1955

Location of Accident and Method of Operation

This accident occurred on that part of the Terminal and New Hampshire Divisions extending between Concord, N. H., and Boston, Mass., 73.32 miles. In the vicinity of the point of accident this is a double-track line, over which trains moving with the current of traffic are operated by timetable, train orders, and an automatic block-signal system. Within yard limits at Lowell, Mass., 47.77 miles south of Concord, the railroad crosses the Concord River. The main tracks are laid on a six-arch bridge of stone construction reinforced with concrete. The bridge is approximately 300 feet in length. An auxiliary track designated as the northward siding, which parallels the main tracks on the east in this vicinity, crosses the river on a pile trestle which adjoins the stone bridge. The combined structures are designated as Bridge 23.79. Immediately north of this bridge tracks of Yard A parallel the main tracks on the west, and tracks of Yard B parallel the main tracks on the east. A lead track connects the south ends of the tracks of Yard A with the southward main track at a switch adjacent to the north end of the bridge. This switch is trailing-point for south-bound movements. The accident occurred on the main tracks at the south end of the bridge, 1.76 miles south of the station at Lowell. From the north on the main tracks there are, in succession, a tangent 2,414 feet in length, a 1°50' curve to the left 881 feet, and a tangent 322 feet to the point of accident and 320 feet southward. From the south there are, in succession, a tangent 1.33 miles in length, a 1°34' curve to the left 2,809 feet, and the tangent on which the accident occurred. The grade is 0.20 percent ascending southward at the point of accident.

Semi-automatic signal LL50, governing north-bound movements on the northward main track, is located 2,215 feet south of the point of accident.

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

102. When a train is disabled or stopped suddenly by an emergency application of the air brakes, or other causes, adjacent tracks * * * must at once be protected until it is ascertained they are safe and clear for the movement of trains.

FOREMEN CAR INSPECTORS

976. * * * They must see that repairs are properly made and that all cars are sent to the shop that are not in safe condition for service.

No car must be allowed to run unless it is in safe and proper condition.

The maximum authorized speeds are 70 miles per hour for passenger trains and 45 miles per hour for freight trains.

Description of Accident

Extra 4209 South, a south-bound freight train, consisted of Diesel-electric units 4209A and 4209B, coupled in multiple-unit control, 76 cars, and a caboose. This train departed from Manchester, N. H., 30.13 miles north of Lowell, at 9 22 p. m. and stopped within yard limits at Lowell about 10 23 p. m. with the front end of the train south of Bridge 23.79. After 23 cars had been set off in Yard A and 22 cars had been added to the train, the sixty-first car was set off and coupled to the cars previously set off in Yard A. When the forward portion of the train started to move southward from Yard A the underframe of a tank car, the fortieth car in the train, broke, and the tank shell and rear portion of the underframe were dislodged and obstructed the northward main track. Several minutes later the tank shell was struck by No. 325.

No. 325, a north-bound first-class passenger train, consisted of Diesel-electric units 4228A and 4228B, coupled in multiple-unit control, one baggage-mail car, one express car, one mail car, one baggage car, two coaches, one sleeping car, one buffet-sleeping car, and four sleeping cars, in the order named. The fourth car was of steel-underframe construction, and the other cars were of all-steel construction. This train passed Winchester, 15.97 miles south of the point of accident and the last open office, at 10 29 p. m., 2 minutes late, passed signal L150, which indicated Proceed, and while moving at a speed of about 60 miles per hour it struck the dislodged portion of the fortieth car of Extra 4209 South and was derailed. Derailed equipment of this train then struck cars of Extra 4209 South on the adjacent main track and a yard locomotive standing on the northward siding.

Diesel-electric unit 1123, assigned to yard service at Lowell, was performing switching service in Yard B. This locomotive was standing on the northward siding a short distance north of Bridge 23.79 when the derailment occurred and was struck by derailed equipment of No. 325.

The locomotive, the first nine cars, and the front truck of the tenth car of No. 325 were derailed. Separations occurred between the locomotive and the first car and at each end of the fourth, fifth, and sixth cars. None of the derailed equipment overturned. The locomotive stopped approximately in line with the track. The front end was approximately 800 feet north of the point of collision. The first three cars stopped between the northward main track and the siding. The front end of the first car was 105 feet south of the rear end of the locomotive. The fourth car struck the yard locomotive. It stopped across the northward main track and the siding at a point 350 feet north of the point of collision. The fifth car stopped at right angles to the tracks immediately north of the bridge. The sixth car was deflected westward and stopped at an angle of about 45 degrees to the tracks. The front end was projecting from the bridge and resting on derailed freight equipment approximately 60 feet west of the tracks and 300 feet north of the point of collision. The other derailed cars stopped in line with the northward main track. The front end of the first Diesel-electric unit was badly damaged, and the second unit was somewhat damaged. The fourth car was destroyed, the fifth car was badly damaged, and the other derailed cars were somewhat damaged. The forty-first to the forty-fourth cars, inclusive, the front truck of the forty-fifth car, and the forty-sixth to the forty-ninth cars, inclusive, of Extra 4209 South were derailed and stopped in various positions on or near the tracks. The fortieth, forty-first, and forty-sixth to forty-eighth cars, inclusive, were destroyed. The other derailed cars were somewhat damaged. The front truck of yard locomotive 1123 was derailed. The front end was considerably damaged.

The engineer, the fireman, the conductor, the baggageman, and one brakeman of No. 325, and the engineer, the fireman, and a yard brakeman of yard locomotive 1123 were injured.

It was raining at the time of the accident, which occurred about 10:48 p. m.

At the time of the accident the fortieth car of Extra 4209 South was T.V.O.X. 1430, an all-steel tank car built in March 1924 and owned by the Tide Water Associated Oil Company, New York, N. Y. The nominal capacity was 10,000 gallons, and the light weight was 44,800 pounds. The tank was approximately 30 feet 9 inches long, and the center sills were 32 feet 3/4 inch in length. The center sills were 13-inch steel channels with 4-3/16-inch flanges and 3/4-inch webs.

The tank was secured to the center sills by a riveted tank anchor 5 feet 6 inches long and by tank bands over the top of the tank near the center and at each end above the body bolsters. The distance between truck centers of the car was 22 feet 6 inches. At the time of the accident the car was empty.

Discussion

After Extra 4209 South stopped at Lovell the eighteenth to the fortieth cars, inclusive, were set off in Yard A, and 22 cars which had been assembled on a track in this yard were added to the train behind the first 17 cars. The train was then moved southward, and the sixty-first car, which had developed an overheated journal, was set off and coupled to the cars previously placed in Yard A. It was then necessary to close the slack in order to detach the defective car from the forward portion of the train. The engineer said that when a southward movement was started after this car was set off the brake-pipe pressure became depleted almost immediately after the locomotive began to move. He said that No. 325 had passed his locomotive when this occurred. When the southward movement was started the conductor was in the vicinity of the lead-track switch. He said that cars in the forward portion of the cut moved southward a short distance but cars in the rear portion remained stationary. He thought that a coupler knuckle had broken. He proceeded to the point where the separation had occurred and then saw that the tank shell of the fortieth car had fallen between the main tracks and that the trucks of the car had remained on the rails. He said that at this time No. 325 was closely approaching, and it struck the tank shell before protection could be provided. The members of the crew said that there had been no severe impacts when cars were coupled during switching operations in the vicinity of Yard A, and, with the exception of the overheated journal, they were unaware of any defective condition of the equipment until the separation occurred in the forward portion of the train.

As No. 325 was approaching the point where the accident occurred the speed was about 62 miles per hour, as indicated by the tape of the speed-recording device. The enginemen were maintaining a lookout ahead from their respective positions in the control compartment at the front of the locomotive, and the members of the train crew were in various locations in the cars of the train. The brakes of this train had been tested and had functioned properly when used en route. The headlight was dimmed because of the locomotive on the adjacent main track. The engineer said he thought the locomotive of Extra 4209 South was

stopped when he passed. He said that when his locomotive was approximately 1,100 feet south of Bridge 23.79 he initiated a service application of the brakes to reduce the speed in compliance with a speed restriction north of the bridge. He said that soon afterward he saw a low, black object on the track approximately 90 feet in front of the locomotive. He immediately moved the brake valve to emergency position. The collision occurred before the speed of the train had been materially reduced. The fireman said that he saw the object on the track about the same time the engineer made the emergency application of the brakes.

Examination of the track in the vicinity of the point of accident disclosed no condition which could have caused or contributed to the cause of the accident.

Examination of the equipment of Extra 4209 South after the accident occurred disclosed that the underframe of the fortieth car, T.V.C. X. 1430, had broken and that the tank shell and a portion of the underframe to which it was attached had been dislodged. Both ends of the tank shell had been ripped open, and all except one of the tank bands had been broken and displaced. The rear portion of the underframe was bent both laterally and vertically, apparently as a result of the collision and contact with other equipment. The center sills at the B, or southward, end of the car were buckled and had broken between the body bolster and the center tank support. The breaks in the center sills and tank bands were all new. The forward portion of the underframe remained coupled to the thirty-ninth car, and the front truck was not derailed. The coupler head was split and the striking casting was driven into the end sill at the B end of the underframe. Examination of the thirty-ninth car, A.R.L.X. 1780, an all-steel refrigerator car, which was the rear car of the cut of 22 cars added to the train at Lowell, disclosed that the striking casting at the A, or northward, end of this car was broken, one center sill was bent, and the uncoupling lever, the sill step on the right side, and one end handhold at this end of the car were bent. These defects were all new and apparently resulted from improper handling, but the time at which this improper handling occurred could not be determined.

The general mechanical superintendent said that in his opinion the underframe of T.V.C.X. 1430 was bent by an impact received during the time cars were being set off and added to the train at the point at which the accident occurred, and when the forward portion of the train was moved southward after the sixty-first car had been set off the pull straightened and broke the underframe. It was his opinion that this allowed the front end of the tank to roll off the front truck and the rear end of the tank and the rear portion of the underframe to tip off the rear truck.

The investigation disclosed that T.W.O.X. 1430, loaded with Diesel fuel oil, was shopped at Yard 8 Shop in the Boston terminal area on August 8, 1955, because of bent center sills and broken side running boards which had been discovered during switching operations in the adjacent hump yard. The running boards were repaired, and, because the center sills could not be repaired while the car was under load, instructions were issued that the car was to be unloaded and returned for repairs. On August 13 the car was moved, without bad order cards, to the Charlestown, Mass., engine house, where it was unloaded. It was then moved, with other empty tank cars, from the engine terminal to a classification track in Yard 8 and was dispatched in a freight train to a plant of the owner at Revere, Mass., 6.23 miles east of Boston. At this point a broken train line was repaired, and the car was loaded and returned to Boston on August 17. On the same day it was humped in Yard 9, then moved to Yard 8 and assembled in an outbound freight train. It was then found to have a broken train line. At this time bad order cards were applied which listed the bent sills at the B end, and the car was placed at Yard 8 Shop on August 18. On August 20 the general car foreman again requested that the car be unloaded and returned for repairs. The car was removed from Yard 8 Shop on the same day, but instead of being placed for unloading it was assembled in a north-bound freight train on the morning of August 22. Members of the shop force were certain that bad order cards were on the car when it was removed from the shop track, but inspectors who inspected the train in which it was assembled prior to departure said that there were no bad order cards on the car at the time of their inspection. The time at which the bad order cards were removed was not determined. The car arrived in Westboro, N. H., 142.55 miles north of Boston, on the same day and was unloaded. On the day of the accident it was assembled in the train of Extra 4209 South, and departed from White River Jct., Vt., 119.13 miles north of the point of accident at 5 46 p. m. The trains in which this car moved on August 15, 22, and 23 were inspected by members of the mechanical force of the carrier prior to departure from the initial terminals, and these employees took no exception to the condition of the car.

After the center sills were first bent their resistance to buffing stresses was no doubt weakened, and subsequent buffing and pulling shocks incidental to switching and train movements would subject them to flexing action at the bends. Apparently they were weakened by this action to the extent that they failed during switching operations in the vicinity of the point of accident.

Cause

This accident was caused by a broken tank-car underframe, and by the dislodged car body and portion of underframe obstructing an adjacent main track in front of an approaching train.

Recommendation

It is recommended that the Boston and Maine Railroad take measures to insure that a car removed from service because of a safety defect is put in proper condition before being returned to service.

Dated at Washington, D. C., this twenty-eighth day of October, 1956.

By the Commission, Commissioner Clarke.

(SEAL)

HAROLD D. McCOY,
Secretary.