

RAILROAD ACCIDENT INVESTIGATION

Report No 3834

HUDSON AND MANHATTAN RAILROAD COMPANY

JERSEY CITY, N J

DECEMBER 14, 1958

INTERSTATE COMMERCE COMMISSION

Washington

SUMMARY

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DATE	December 14, 1958	
RAILROAD	Hudson & Manhattan	
LOCATION	Jersey City, N J	
KIND OF ACCIDENT	Rear-end collision	
TRAINS INVOLVED	Passenger	Passenger
CONSISTS	3 electrically propelled passenger units	2 electrically propelled passenger units
SPEED	Standing	15 m p h
OPERATION	Signal indications	
TRACK	Double, tangent, 0 24 percent ascending grade westward	
WEATHER	Cloudy	
TIME	3 27 a m	
CASUALTIES	35 injured	
CAUSE	Failure to control the speed of the following train	
RECOMMENDATION	That the H & M prescribe the names and the indications of aspects displayed by all signals between the west end of the H & M tracks and signal 30L, and that such names, indications, and aspects be included in the current H & M book of operating rules	

INTERSTATE COMMERCE COMMISSION

REPORT NO 3834

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

HUDSON AND MANHATTAN RAILROAD COMPANY

June 2, 1959

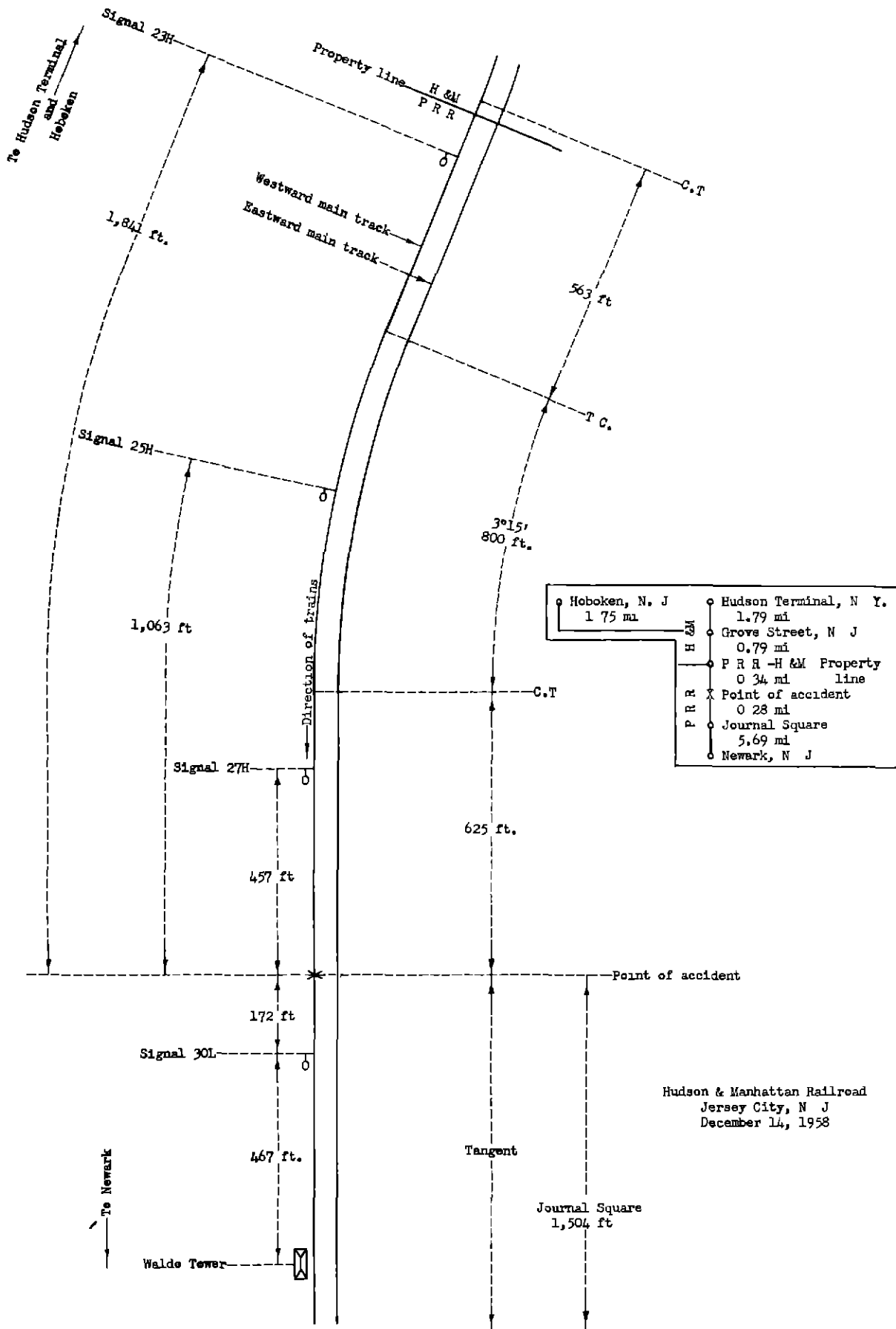
Accident at Jersey City, N J , on December 14, 1958, caused by a failure to control the speed of the following train

REPORT OF THE COMMISSION ¹

FREAS, Commissioner

On December 14, 1958, at Jersey City, N J , there was a rear-end collision between 2 passenger trains of the Hudson and Manhattan Railroad, which resulted in the injury of 2 train-service employees and 33 passengers

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



Hudson & Manhattan Railroad
 Jersey City, N. J.
 December 14, 1958

Location of Accident and Method of Operation

Tracks of the Hudson and Manhattan Railroad (H & M) extend 2.58 miles westward from Hudson Terminal, New York, N. Y., to a point 3,272 feet east of Journal Square, Jersey City, N. J. At Grove Street Station, Jersey City, 1.41 miles east of Journal Square, these tracks are connected with a line extending 1.75 miles northward to Hoboken, N. J. Between the west end of the H & M tracks and Newark, N. J., 5.69 miles west of Journal Square, H & M trains are operated on tracks of the Pennsylvania Railroad (P. R. R.). The P. R. R. tracks from the west end of the H & M tracks to Journal Square are used exclusively for the operation of H & M trains. In the vicinity of the point of accident this is a double-track line over which trains are operated by signal indications supplemented by an intermittent mechanical-trip automatic train-stop system. A power rail is provided for the electric propulsion of trains.

The accident occurred on the westward main track, 1,504 feet east of Journal Square and 1.12 miles west of Grove Street Station. From the east there are, in succession, a tangent 563 feet in length, a $3^{\circ}15'$ curve to the left 800 feet, a tangent 625 feet to the point of accident and a considerable distance westward. In this vicinity the average grade is 0.24 percent ascending westward.

P. R. R. automatic signals 23H, 25H, 27H, and semi-automatic signal 30L, governing westbound movements on the westward main track are located 1,841 feet east, 1,063 feet east, 457 feet east, and 172 feet west of the point of accident, respectively. The first three signals named are of the position-light dwarf type. Signal 30L is of the position-light bridge-mounted type, and is controlled by the operator at Waldo Tower, 467 feet west of the signal. The four signals are continuously lighted and each displays 4 aspects. A mechanical-trip automatic train-stop tripping device is associated with, and about 8 feet west of, each signal. Cut-sections are provided within the blocks of signals 23H and 27H. The insulated joints of the cut-section between signals 27H and 30L are 294 feet west of signal 27H.

Movements of westbound H & M trains are governed by the timetable and the operating rules of the P. R. R. between signal 30L and Newark. Although the H & M management asserted that the current H & M book of operating rules, which became effective on September 30, 1952, governs the operation of H & M trains between the west end of the H & M tracks and signal 30L, this book does not contain any rules pertaining to aspects displayed by signals 23H, 25H and 27H. Officials of the carrier stated that the rules governing the aspects displayed by these three signals are those which were contained in the special instructions of the 1932 P. R. R. timetable and which were omitted from subsequent P. R. R. timetables. The H & M, however, has not issued any bulletins or instructions since 1932 specifying that the 1932 P. R. R. timetable special instructions relating to signals 23H, 25H and 27H have remained in effect. It could not be determined whether H & M train-service employees received oral instructions concerning the 1932 P. R. R. timetable special instructions when attending rule-instruction classes of the H & M or P. R. R.

The signal aspects and indications applicable to this investigation as contained in the 1932 P. R. R. timetable special instructions, are as follows:

Signal	Aspect	Indication
23H	Two white lights in vertical position	Proceed
25H		

25H	Two white lights in diagonal position to the right	Proceed next signal at "stop "
27H	Two white lights in horizontal position	Stop

The signal aspect, indication, and name applicable to this investigation, as contained in the P R R operating rules, are as follows

Signal	Aspect	Indication	Name
30L	Three amber lights in horizontal position	Stop	Stop-signal

The controlling circuits are so arranged that when the blocks of signals 23H, 25H and 27H are unoccupied and signal 30L indicates "Stop," the mechanical-trip automatic train-stop tripping device associated with signal 30L will be in tripping position, signals 23H and 25H will indicate "Proceed," and signal 27H will indicate "Proceed next-signal-at-'stop' " When the portion of the block between signal 27H and the cut-section in the block of signal 27H is occupied, signal 23H will indicate "Proceed next-signal-at-'stop'," signals 25H and 27H will indicate "Stop," and the mechanical-trip automatic train-stop tripping device associated with signal 25H will be in tripping position. When only that portion of the block of signal 27H west of the cut-section is occupied, signal 23H will indicate "Proceed," signal 25H will indicate "Proceed next-signal-at-'stop'," signal 27H will indicate "Stop," and the mechanical-trip automatic train-stop tripping device associated with signal 27H will be in tripping position.

The Interstate Commerce Commission's Rules, Standards and Instructions, Ex Parte No 171 (278 I C C 267), read in part as follows

136 502 Automatic brake application, initiation by restrictive block conditions stopping distance in advance—An automatic train-stop or train-control system shall operate to initiate an automatic brake application at least stopping distance from the entrance to a block, wherein any condition described in 136 205 obtains, and at each signal requiring a reduction in speed

For reference, Section 136 205, referred to in Section 136 502, reads as follows

136 205 Signal control circuits, requirements—The circuits shall be so installed that each signal governing train movements into a block will display its most restrictive aspect when any of the following conditions obtains within the block (1) Occupancy by a train, locomotive, or car, (2) when points of a switch are not closed in proper position, (3) when an independently operated fouling point derail equipped with switch circuit controller is not in derailing position, and (4) when a track relay is in deenergized position, or when signal control circuit is deenergized

The maximum authorized speed for passenger trains in the vicinity of the point of accident is 40 miles per hour

Description of Accident

Trains operating over the H & M are designated by their departure time from initial terminals

The 3 16 a m train from Hoboken Terminal, a westbound passenger train, consisting of three electrically propelled passenger units of all-steel construction, coupled in multiple-unit control, departed southward from Hoboken on time. This train entered the westward main track at Grove Street Station, passed signals 23H and 25H which indicated "Proceed," passed signal 27H which indicated "Proceed next-signal-at-stop," passed the insulated joints of the cut-section in the block of signal 27H, and about 3 25 a m it stopped short of signal 30L which indicated "Stop." Approximately two minutes later the rear end was struck by the 3 20 a m train from Hudson Terminal

The 3 20 a m train from Hudson Terminal, a westbound passenger train, consisting of two electrically propelled passenger units of all-steel construction, coupled in multiple-unit control, departed from Hudson Terminal on time. This train passed Grove Street Station, passed signal 23H which indicated "Proceed," passed signal 25H which indicated "Proceed next-signal-at-stop," passed signal 27H which indicated "Stop," and while moving at an estimated speed of 15 miles per hour it struck the rear end of the 3 16 a m train from Hoboken.

The preceding train was moved about 23 feet westward as a result of the collision. No equipment of either train was derailed. The first unit of the preceding train was slightly damaged, the second unit was somewhat damaged and the third unit was heavily damaged. Both units of the following train were slightly damaged.

The conductor and the flagman of the following train were injured.

The weather was cloudy at the time of the accident, which occurred about 3 27 a m.

The type of automatic train-stop valve provided for units of the 3 20 a m train from Hudson Terminal consists of a valve and a rotating arm extending downward to actuate the valve mechanism. It is so constructed that brake-pipe air is vented to the atmosphere at an emergency rate when the arm is rotated by striking a wayside automatic train-stop tripping device. One valve is mounted on the bracket holding the shoe-beam on the side of the car opposite the control compartment of the unit, and when properly adjusted the arm will strike the tripper of the wayside automatic train-stop tripping device when the device is in tripping position.

The wayside automatic train-stop tripping devices are operated electropneumatically. The operating mechanism of each device is located between the rails. A shaft extends at right angles to the track and to the outside of each rail. The tripper arms for the type of automatic train-stop valve involved in this accident are located on the left side of the shaft relative to the direction of the current of traffic. In non-tripping position the tripper arms are at an angle of approximately 45 degrees. In moving to tripping position, the shaft rotates through an angle of approximately 45 degrees, placing the tripper arms in vertical position.

The units of the 3 20 a m train from Hudson Terminal were provided with SMEE brake equipment, ME-42 brake valves, and variable load control valves. The units were not provided with devices for applying sand to the rails.

H & M operating rules do not provide for flag protection when a train is stopped on a main track under circumstances in which it may be overtaken by another train

Discussion

Shortly before 3 25 a m , signal 30L was caused to display a "Stop" aspect. An examination later disclosed that an air-pipe located under the westward main track was raised by heavy frost a sufficient distance to come in contact with the rails of the track, shunting the signal circuits.

The 3 16 a m train from Hoboken approached the point where the accident occurred at a speed of 35 to 40 miles per hour. As the train approached signal 27H, which indicated "Proceed next signal at 'stop'," the speed was reduced to about 20 miles per hour and the train was stopped with the front end approximately 15 feet east of signal 30L which indicated "Stop". About two minutes later the rear end was struck by the 3 20 a m train from Hudson Terminal.

As the 3 20 a m train from Hudson Terminal was approaching the point where the accident occurred, the motorman was in the control compartment at the front of the first unit, and the conductor and the flagman were in the passenger section of the same unit. The brakes of the train had functioned properly when used en route. The motorman said that as the train approached signal 23H he increased the speed from about 30 miles per hour to 35 - 40 miles per hour after observing that the signal indicated "Proceed". After the train passed signal 23H and reached a point about 400 feet east of signal 25H he made a service application of the brakes upon observing that signal 25H indicated "Proceed next-signal-at-'stop'". He said that although he increased this brake application, it did not materially reduce the speed as the train closely approached signal 25H. He said that when the train was in the immediate vicinity of signal 25H he applied the brakes in emergency because he observed signal 27H indicating "Stop" and a train occupying the block of that signal. The motorman moved the controller to reverse position and applied power in a further attempt to stop the train short of signal 27H, but the train continued to move at a decelerating speed, passed signal 27H, and collided with the preceding train at an estimated speed of 15 miles per hour.

After the accident occurred an examination of the brake equipment of the 3 20 a m train from Hudson Terminal disclosed that the brakes of this train functioned as intended.

An inspection of the westward main track was made shortly after the accident occurred. It disclosed skid marks on the heads of the rails throughout a distance of 705 feet eastward from the point of accident, indicating that the wheels of the train had been sliding.

On December 17, 1958, the equipment of the 3 20 a m train from Hudson Terminal which was involved in the accident was used in a series of tests to determine stopping distances. Four of the tests were made on the westward main track in the vicinity of the point of accident with the following results:

An emergency application of the brakes was made at a point 165 feet east of signal 27H while the train was moving at a speed of 40 miles per hour. The train stopped with the front end 679 feet west of the point where the brake application was made and 57 feet beyond the point of accident. In another test an emergency application was made at the same point while the train was moving at a speed of 31 miles per hour. In this test the train stopped with the front end 267 feet west of

signal 27H and 190 feet short of the point of accident

An emergency application of the brakes was made at signal 27H while the train was moving at a speed of 36 miles per hour. The train stopped with the front end 593 feet west of signal 27H and 136 feet beyond the point of accident. Another emergency brake application was made at the same point while the train was moving at a speed of 31 miles per hour. In this test the train stopped with the front end 354 feet west of signal 27H and 103 feet short of the point of accident.

During the foregoing tests it was observed that there was considerable sliding of the wheels.

In three other tests made on the main tracks west of Journal Square, full service applications of the brakes were initiated while the train was moving at speeds of 29, 40 and 44 miles per hour. The train stopped with its front end 279 feet, 477 feet, and 539 feet, respectively, from the point where the brake applications were made. During these three tests it was observed that there was little sliding of the wheels.

An examination of the tracks in the vicinity of the point of accident disclosed that the heads of the rails of the westward main track were coated with oil and other foreign substances throughout a considerable distance east of the point of accident. This condition apparently resulted from the normal movement of trains over this portion of the track.

In view of the results of the tests made to determine stopping distances and the skid marks which extended 705 feet eastward from the point of collision, it is apparent that the wheels of the 3 20 a m train from Hudson Terminal were sliding as a result of the oil and foreign substance on the rails during the brake applications made shortly before the accident occurred. It is also apparent that the emergency application of the brakes of this train was not initiated in the immediate vicinity of signal 25H as stated by the motorman, but was initiated at a point immediately in advance of the skid marks which extended westward from a point 257 feet east of signal 27H.

Section 136 502 of the Commission's Rules, Standards and Instructions, Ex Parte No 171 (278 I C C 267), requires that an automatic train-stop system shall operate to initiate an automatic brake application at least stopping distance from the entrance to a block occupied by a train, locomotive, or car. In the instant case, the investigation disclosed that the mechanical-trip automatic train-stop devices associated with signals 25H and 27H were located approximately 8 feet west of their respective signals and were not installed as required. These devices are so installed that, under certain circumstances, where conditions within a block cause the signal to display its most restrictive aspect, only the device associated with the signal at the entrance to that block is in tripping position. Under these conditions, an automatic emergency application of the brakes of a train will not be initiated until the train has entered the block and proceeded westward a distance of about 8 feet. If the mechanical-trip automatic train-stop devices associated with signals 25H and 27H had been installed as required, sufficient stopping distance would have been provided to enable the 3 20 a m train from Hudson Terminal to stop short of the entrance to the block controlled by signal 27H, and the accident probably would have been averted. In this connection, the Commission has taken action to obtain compliance with Section 136 502 of the Rules, Standards and Instructions, Ex Parte No 171 (278 I C C 267), with respect to the automatic train-stop system installed between the west end of the H & M tracks and P R R semi-automatic signal 30L.

Cause

This accident was caused by a failure to control the speed of the following train

Recommendation

Inasmuch as the H & M current book of operating rules governs the operation of H & M trains between the west end of the H & M tracks and signal 30L, it is recommended that the carrier prescribe the names and the indications of aspects displayed by all signals within these limits, and that such names, indications, and aspects be included in the current H & M book of operating rules

Dated at Washington, D C , this second
day of June, 1959

By the Commission, Commissioner Freas

(SEAL)

HAROLD D McCOY,

Secretary