

RAILROAD ACCIDENT INVESTIGATION

REPORT NO 4105

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS

ST. LOUIS, MO.

NOVEMBER 18, 1966

**DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION**

WASHINGTON

SUMMARY

DATE:	November 18, 1966	
RAILROAD:	Terminal Railroad Association of St. Louis	
LOCATION:	St. Louis, Mo.	
KIND OF ACCIDENT:	Rear-end collision	
TRAINS INVOLVED:	Freight	Freight
TRAIN NUMBERS:	Extra 561 West	Extra 1239 West
LOCOMOTIVE NUMBERS:	Diesel-electric unit 561	Diesel-electric units 1239, 1240
CONSISTS:	41 cars, caboose	86 cars, caboose
ESTIMATED SPEEDS:	Standing	8-10 m.p.h.
OPERATION:	Timetable, train orders automatic block-signal sys- tem; yard limits. Movements against current of traffic by manual block signal indications.	
TRACKS:	Double; tangent; 0.61 percent ascending grade westward	
WEATHER:	Clear	
TIME:	11:55 p. m.	
CASUALTIES:	1 killed; 1 injured	

CAUSE.

Improperly permitting a train to enter an occupied manual block under a Clear manual block-signal indication, failure of the carrier to arrange for adequate flag protection to the rear of the preceding train, and failure of the engineer and conductor to operate the following train under control as required.

RECOMMENDATION.

That the Terminal Railroad Association of St. Louis immediately take the action necessary to enforce its operating rules and timetable special instructions.

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY BOARD

RAILROAD ACCIDENT INVESTIGATION
REPORT NO. 4105

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SYNOPSIS

On November 18, 1966, a rear-end collision occurred between two Terminal Railroad Association of St. Louis freight trains at St. Louis, Mo. One employee was killed and one was injured.

The accident was caused by improperly permitting a train to enter an occupied manual block under a Clear manual block-signal indication, failure of the carrier to arrange for adequate flag protection to the rear of the preceding train, and failure of the engineer and conductor to operate the following train under control as required

LOCATION AND METHOD OF OPERATION

The accident occurred on that part of the Merchants Division extending between Granite City, Ill., and Union Station, St. Louis, Mo., a distance of 8.9 miles. In the accident area, this is a double-track line over which trains moving with the current of traffic operate by timetable, train orders, an automatic block-signal system, and yard-limit rules. Trains moving against the current of traffic operate by timetable, train orders, a manual block-signal system, and yard-limit rules. The operations of the carrier are entirely within yard limits.

The collision occurred on the eastward main track, 1.8 miles east of Union Station, St. Louis.

In the accident area, the main tracks are laid in a cut having concrete retaining walls of considerable height. In this area,

there are three tunnels. They are designated as the north, main, and south tunnels and are, respectively, 550 feet, 960 feet, and 365 feet in length. The west portals of the north and main tunnels, are, respectively, 1,975 feet and 300 feet east of the accident point. The east portal of the south tunnel is 530 feet west of the accident point. Because of the walls of the cut, the north and main tunnels, and vertical curvature of the track, the view ahead from a westbound train approaching the collision point is materially restricted.

An interlocking is located at North Market Street, 2.1 miles east of the collision point. The interlocking station is provided with a train order signal of the color-light type, which is used as a manual block-signal for governing movements westward against the current of traffic on the eastward main track to the interlocking at Gratiot Street, 3,670 feet west of the collision point.

Automatic signal 10D, governing westbound movements on the eastward main track, is 894 feet west of the collision point. It is the approach signal for the westward home signal at the Gratiot Street interlocking.

Details concerning the tracks, signals, carrier's operating rules, timetable special instructions, trains involved, damages, and other factors are set forth in the appendix.

DESCRIPTION AND DISCUSSION

On the day of the accident, the leverman at the North Market Street interlocking station received train order No. 19, which read in part as follows:

TRA frt Eng 1206
 " " " 561
 " " " 1239 1240
 on Eastward track N Market
 to Gratiot.

The trains named in this order were westbound trains. The order required these trains to be routed over the eastward main track, against the current of traffic, between the North Market Street and Gratiot Street interlockings. Extra 1206 West passed the North Market Street interlocking at 11:12 p.m. and passed the Gratiot Street interlocking without incident.

Extra 561 West, a westbound freight train consisting of 1 diesel-electric unit, 41 cars and a caboose, passed East Approach

"SH", 7 miles east of Union Station, at 11:03 p.m. Soon afterward, it entered the North Market Street interlocking. It then passed the train order signal, which displayed a Proceed aspect and, at 11:26 p.m., entered the eastward main track. The train proceeded westward against the current of traffic on the eastward main track and the front of the train passed signal 10D, causing that signal to display a Stop aspect. Soon thereafter, the train stopped on the eastward main track with the front end short of the westward home signal of the Gratiot Street interlocking and with the rear end between the main and south tunnels, 894 feet east of signal 10D. The engineer and conductor were on the locomotive at this time. The flagman, the only other crew member, remained inside the caboose when the train stopped. About ten minutes later, according to his estimate, he saw the headlight of Extra 1239 West approaching from the east. He then proceeded to the rear platform of the caboose and began to give the approaching train stop signals with a white light. He said he received no acknowledgement of his stop signals. While the locomotive of Extra 1239 West was moving in the main tunnel, the flagman realized a collision was inevitable, and he alighted from the caboose. Shortly thereafter, at 11:55 p.m., the rear of Extra 561 West was struck by Extra 1239 West, 300 feet west of the west portal of the main tunnel and 894 feet east of signal 10D.

The conductor of Extra 1239 West was killed and the engineer of that train was injured.

Extra 1239 West, a westbound freight train consisting of 2 diesel-electric units, 86 cars and a caboose, left Bremen Avenue, 4.9 miles east of Union Station, at 11:27 p.m., with the engineer and conductor in the control compartment at the east end of the first locomotive unit. The flagman, the only other crew member, was in the caboose. About ten minutes later, the train stopped short of the westward home signal of the North Market Street interlocking. Soon thereafter, it proceeded westward beyond the home signal, which displayed a Restricting aspect, and passed the train order signal, which displayed a Proceed aspect, according to the engineer. It then proceeded through the interlocking and, at 11:40 p.m., entered the eastward main track. The engineer stated that the train proceeded westward against the current of traffic at 8 to 10 miles per hour. He further stated that soon after the locomotive emerged from the west portal of the north tunnel, the conductor called

that a Stop aspect was being displayed by signal 10D, which was 894 feet beyond the point where the rear end of Extra 561 West was standing. According to the engineer's statements, he was looking rearward at the control panel of the locomotive at this time, and he immediately initiated a service application of the brakes, in preparation for stopping short of signal 10D. He said that after the locomotive entered the main tunnel and before the service brake application had been completed, he looked forward in the direction of the movement and saw the rear end of Extra 561 West a short distance ahead, and also saw the flagman of that train giving stop signals. He said he immediately applied the train brakes in emergency, called a warning to the conductor, and alighted from the locomotive. A few moments later, before its speed was materially reduced, the train struck the rear of Extra 561 West.

The leverman at the North Market Street interlocking station said that after Extra 561 West moved through the interlocking and entered the eastward main track, he established the route for Extra 1239 West to move through the interlocking to the eastward main track and caused the train order signal to display a Proceed Under Control aspect, as prescribed by timetable special instructions. However, it is apparent that he was mistaken about causing the train order signal to display a Proceed Under Control aspect for Extra 1239 West, for shortly after the accident occurred a signal maintainer and the Superintendent of Signals and Communications found the train order signal displaying a Proceed aspect. Statements of the leverman indicate that it was common practice for him to leave the train order signal displaying a Proceed aspect after a train entered the manual block involved.

The investigation disclosed that after Extra 561 West, the preceding train, stopped on the eastward main track within the manual block extending between the North Market Street and Gratiot Street interlockings, the flagman was required by Rule 99 to provide protection against following trains. It also disclosed that under the carrier's interpretation of Rule 99, the flagman was not required to leave the caboose to provide such protection.

FINDINGS

The leverman at the North Market Street interlocking station evidently permitted his train order signal to improperly display a Clear aspect for Extra 1239 West, although the manual block

controlled by that signal was occupied by Extra 561 West. The failure of the leverman to cause the train order signal to display a Proceed Under Control aspect for Extra 1239 West, as required, and thereby indicate to the engineer that the manual block was occupied, evidently contributed to the cause of the accident.

When the flagman of Extra 561 West saw Extra 1239 West approaching from the rear, he provided protection for his train in accordance with the carrier's interpretation of Rule 99. However, it is evident that such protection was inadequate to insure full protection, as prescribed by Rule 99, and had the flagman afforded protection to the rear of his train in accordance with provisions of that rule, instead of the carrier's interpretation thereof, the accident would probably have been avoided. In view of the circumstances involved in this accident, the carrier evidently should consider rescinding its interpretation of Rule 99 if adequate flagging protection is to be provided for a train stopped under circumstances in which it may be overtaken by another train.

After Extra 1239 West entered the North Market Street interlocking, it passed the interlocking station train order signal, which displayed a Clear aspect. Under these circumstances, the train was authorized to proceed in the manual block involved and the aspect displayed by the train order signal indicated that the block was unoccupied. However, under the carrier's operating rules, a proceed signal does not insure an unobstructed track ahead and a train or engine operating on any track of the carrier must move under control, prepared to stop short of a train engine or obstruction, but not exceeding 25 miles per hour. It is evident that Extra 1239 West was not moving under control as required as it approached the rear of Extra 561 West, resulting in the collision.

CAUSE

This accident was caused by improperly permitting a train to enter an occupied manual block under a Clear manual block-signal indication, failure of the carrier to arrange for adequate flag protection to the rear of the preceding train, and failure of the engineer and conductor to operate the following train under control as required.

RECOMMENDATION

It is recommended that the Terminal Railroad Association of St. Louis immediately take the action necessary to enforce its operating rules and timetable special instructions.

*Dated at Washington, D. C., this 18th
day of April 1967.*

*By the Federal Railroad Administration,
Railroad Safety Board.*

BETTE E. HOLT

Acting Executive Secretary

Federal Railroad Administration

Appendix

TRACK

From the east on the eastward main track there are, in succession, a 2°36' curve to the left 280 feet, and a tangent 1,798 feet to the collision point and 881 feet westward. The average grade for westbound trains is, successively, 0.94 percent descending 3,510 feet, a vertical curve 300 feet, and 0.61 percent ascending 600 feet to the accident point.

SIGNAL

Signal 10D is of the color-light searchlight type and is continuously lighted. The aspect applicable to this investigation and the corresponding indication and name are as follows:

Signal	Aspect	*Indication	Name
10D	Red	Stop, then proceed, prepared to stop short of train, obstruction, or switch not properly lined and look out for broken rail, but not to exceed 15 M.P.H.	Grade
Train order signal	Green	Proceed	
	Yellow	Proceed Under Control	

CARRIER'S OPERATING RULES

TRAIN UNDER CONTROL - Proceed, prepared to stop short of train, engine, obstruction or switch not properly lined, but not exceeding 25 miles per hour.

93. When a train stops on a main track under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals at a sufficient distance to insure full protection. ***

110. A proceed signal, *** does not insure an unobstructed track ahead, *** The tracks of this company are one continuous yard. *** Movements must be made with train or engine under control.

1221. Unless otherwise provided, a fixed signal must be used at each train order office, which shall indicate "stop" where there is an operator on

duty, except when changed to "proceed" to allow a train to pass when there are no train orders for any train in that direction. ***

261. On portions of the road so specified on the time-table, trains will run against the current of traffic by interlocking or block signals, whose indications *** will take the place of train orders.

TIMETABLE SPECIAL INSTRUCTIONS

319 - Movements against the current of traffic between Granite City and Gratiot Street Interlocking Plants must be governed by the indication of three position train order signals at North Market Street, *** Such signals *** may also be used to supplement or supersede automatic block signals *** in the same manner as follows:

When the front of a train or engine has passed such signal, the operator will display a PROCEED UNDER CONTROL indication until movement has passed the next station in advance, and restore it to STOP, unless a following train on the same track has entered the block, when the signal must remain in PROCEED UNDER CONTROL position until the block is clear. If the block is clear when a train or engine approaches, the PROCEED indication will be displayed.

TRAINS

Extra 561 West consisted of switcher-type diesel-electric unit 561, 41 cars and a caboose. The train brakes had been tested and had functioned properly en route.

Extra 1239 West consisted of switcher type diesel-electric units 1239 and 1240, coupled in multiple-unit control, 86 cars and a caboose. The train brakes had been tested and had functioned properly en route. The headlight was lighted brightly.

DAMAGES

The caboose and one car of Extra 561 West were derailed. The caboose stopped above the retaining wall adjacent to the eastward main track. It was destroyed. The derailed car remained on the track structure. It was considerably damaged.

Extra 1239 West stopped with the front end 33 feet west of the collision point. The two diesel-electric units and the first three cars were derailed. They stopped in various positions on the track structure. The first diesel-electric unit was destroyed and the second unit was heavily damaged. Of the derailed cars, one was slightly damaged and two were considerably damaged.

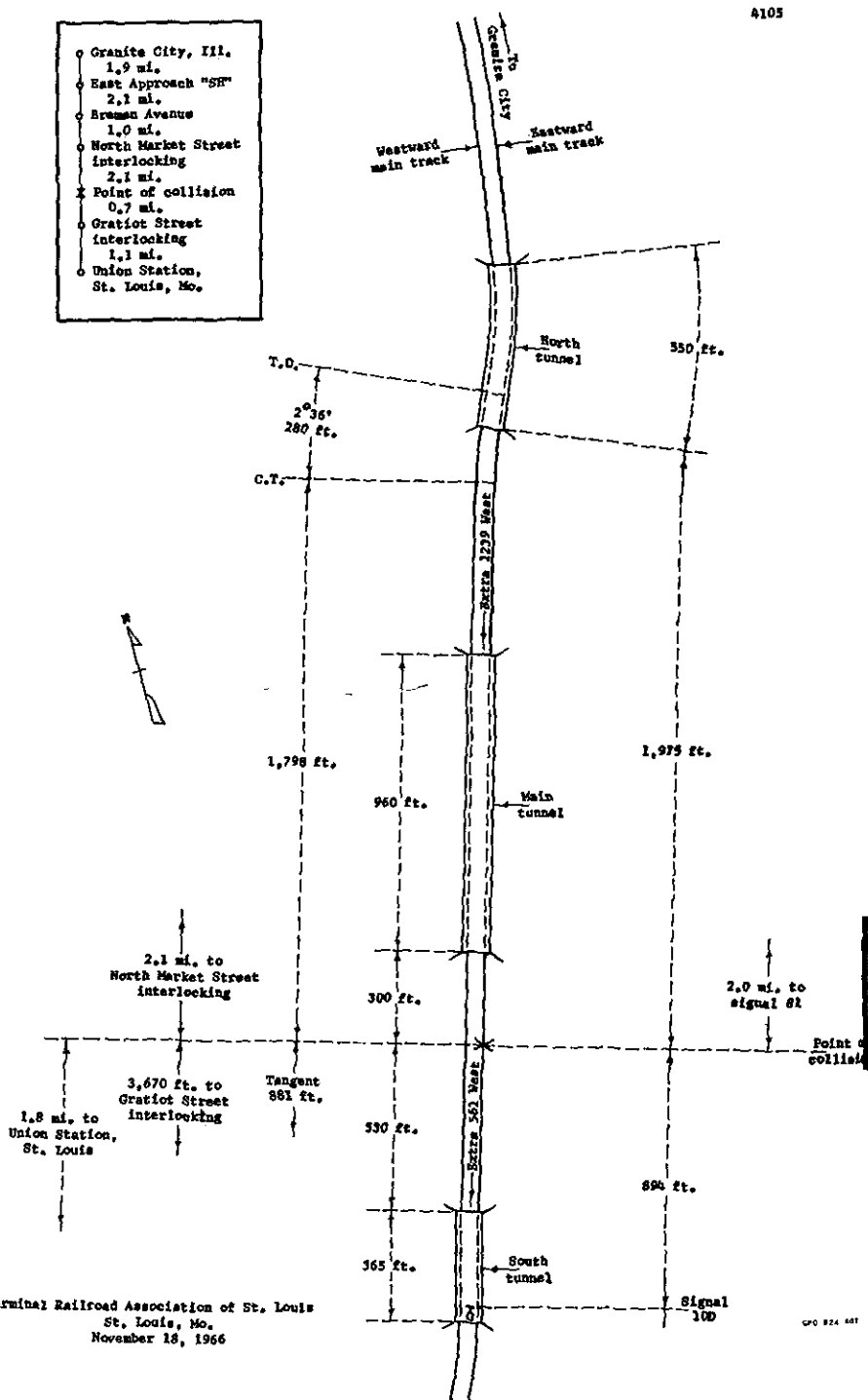
OTHER FACTORS

The accident occurred at 11:55 p.m., in clear weather.

The maximum authorized speed for all trains in the accident area was 25 miles per hour.

At the time of the accident the crew members of Extra 1239 West had been on duty 7 hours 55 minutes after having been off duty 12 hours 50 minutes. The crew members of Extra 561 West had been on duty 9 hours 15 minutes, after an off duty period of 11 hours 50 minutes. The leverman at the North Market Street interlocking station had been on duty 55 minutes after an off duty period of 16 hours.

- Granite City, Ill.
- 1.9 mi.
- East Approach "SR"
- 2.1 mi.
- Bremen Avenue
- 1.0 mi.
- North Market Street interlocking
- 2.1 mi.
- ✕ Point of collision
- 0.7 mi.
- Gratiot Street interlocking
- 1.1 mi.
- Union Station, St. Louis, Mo.



Terminal Railroad Association of St. Louis
St. Louis, Mo.
November 18, 1966