

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3628
SOUTHERN RAILWAY COMPANY
IN RE ACCIDENT
AT LENOIR CITY, TENN., ON
MAY 7, 1955

SUMMARY

Date: May 7, 1955

Railroad: Southern

Location: Lenoir City, Tenn.

Kind of accident: Rear-end collision

Trains involved: Freight : Freight

Train numbers: Extra 2134 West : First 55

Engine numbers: Diesel-electric : Diesel-
unit 2134 electric
units 4147,
6183, and
4157

Consists: 33 cars, caboose : 109 cars,
caboose

Estimated speeds: Standing : 15-40 m. p. h.

Operation: Timetable, train orders, and
automatic block-signal
system; yard limits

Track: Single; 3° curve; 0.88 percent
descending grade westward

Weather: Clear; dusk

Time: 7:55 p. m.

Casualties: 3 injured

Cause: Failure properly to control
speed of following train
moving within yard limits

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3628

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

SOUTHERN RAILWAY COMPANY

June 27, 1955

Accident at Lenoir City, Tenn., on May 7, 1955,
caused by failure properly to control the
speed of the following train moving within
yard limits.

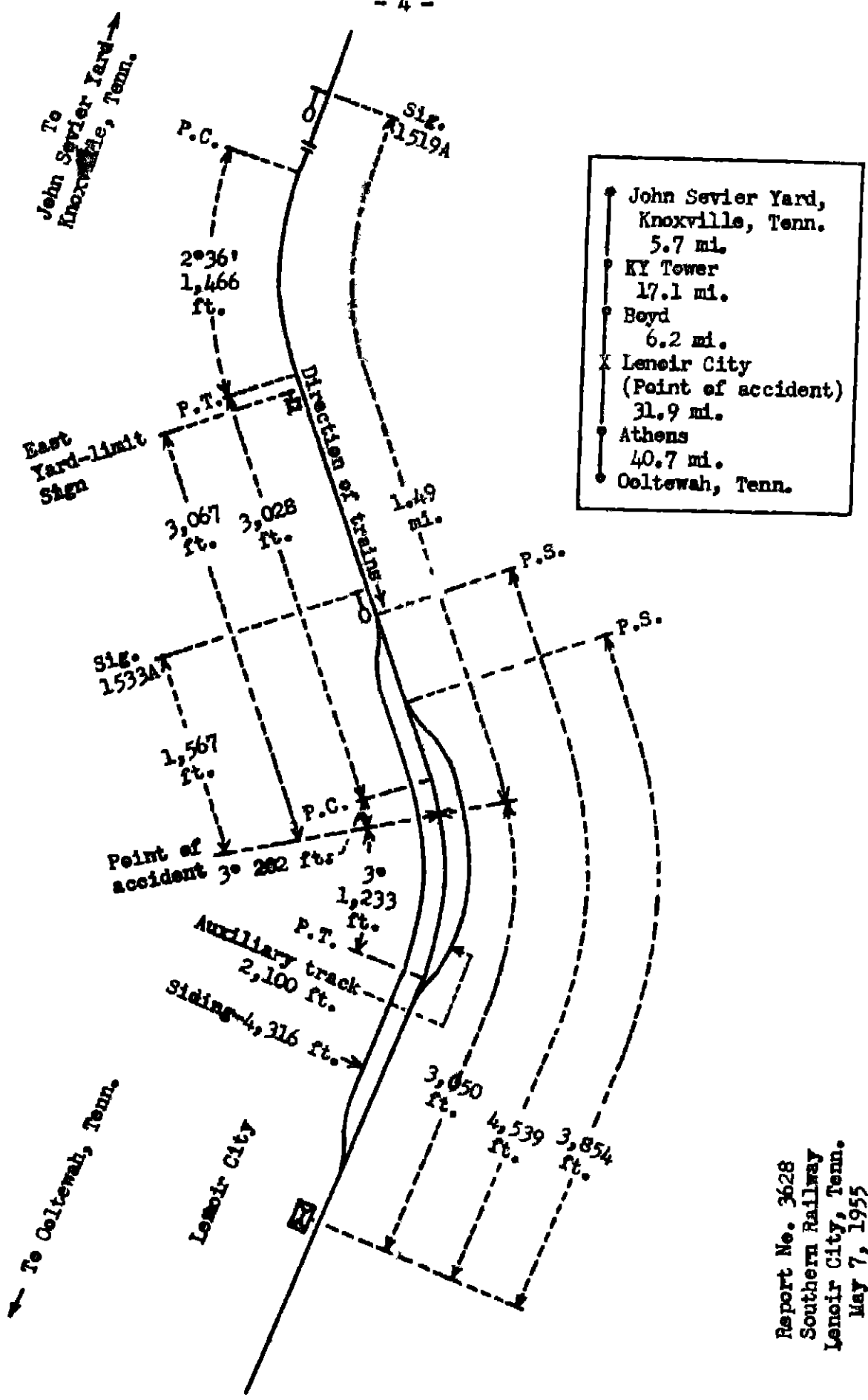
REPORT OF THE COMMISSION¹

CLARKE, Commissioner:

On May 7, 1955, there was a rear-end collision
between two freight trains on the Southern Railway
at Lenoir City, Tenn., which resulted in the injury
of three employees.

¹
Under authority of section 17 (2) of the Interstate
Commerce Act the above-entitled proceeding was referred
by the Commission to Commissioner Clarke for consider-
ation and disposition.

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Report No. 3628
 Southern Railway
 Lenoir City, Tenn.
 May 7, 1955

Location of Accident and Method of Operation

This accident occurred on that part of the Knoxville Division extending between John Sevier Yard, near Knoxville, and Ooltewah, Tenn., 101.6 miles. In the vicinity of the point of accident this is a single-track line, over which trains are operated by timetable, train orders, and an automatic block-signal system supplemented by an intermittent inductive automatic train-stop system. Within yard limits at Lenoir City, 29.0 miles west of John Sevier Yard, a siding 4,316 feet in length parallels the main track on the north and an auxiliary track 2,100 feet in length parallels the main track on the south. The east switches of the auxiliary track and the siding are located, respectively, 3,854 feet and 4,539 feet east of the station. The accident occurred on the main track at a point 3,067 feet west of the east yard-limit sign and 3,050 feet east of the station. From the east there are, in succession, a 2°36' curve to the left 1,466 feet in length, a tangent 3,028 feet, and a 3° curve to the right 202 feet to the point of accident and 1,233 feet westward. The grade for west-bound trains is, successively, 0.23 percent ascending a distance of 1,100 feet, 0.47 percent ascending 400 feet, 0.93 percent ascending 700 feet, a vertical curve 1,000 feet, and 0.88 percent descending 675 feet to the point of accident.

Automatic signals 1519A and 1533A, governing west-bound movements, are located, respectively, 1.49 miles and 1,567 feet east of the point of accident. These signals are of the color-light type and are continuously lighted. The aspects and the corresponding indications and names are as follows:

<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
Green	PROCEED	CLEAR SIGNAL
Yellow	PROCEED, PREPARING TO STOP AT NEXT SIGNAL. TRAIN EXCEEDING MEDIUM SPEED MUST AT ONCE REDUCE TO THAT SPEED	APPROACH SIGNAL
Red	PROCEED AT RESTRICTED SPEED	RESTRICTED-PROCEED SIGNAL

The control circuits are arranged on the absolute-permissive-block principle. The most restrictive indication of the leaving signals at the ends of sidings is Stop, and the most restrictive indication of the intermediate signals is Proceed-at-restricted-speed. Signals 1519A and 1533A are intermediate signals. When the block of signal 1519A is unoccupied and the block of signal 1533A is occupied, signal 1519A indicates Proceed-preparing-to-stop-at-next-signal and signal 1533A indicates Proceed-at-restricted-speed. The automatic train-stop system is arranged to initiate a full service application of the brakes at a signal displaying a restrictive aspect unless the acknowledging lever of the forestalling device is manipulated by the engineer as the receiver on the locomotive passes over the inductor located in approach to the signal.

Electric power for the portion of the signal system extending between Knoxville and Athens, 31.9 miles west of Lenoir City, is supplied from a sub-station located adjacent to KY Tower in Knoxville. The power supply may be cut off by the operation of a switch controlled from KY Tower. When this is done the lights in all signals in the territory become extinguished.

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

DEFINITIONS

Medium Speed.--One-half authorized speed, at point involved, but not exceeding 30 miles per hour.

Restricted Speed.--Proceed prepared to stop short of another train, obstruction, or switch not properly lined and look out for broken rail, but at a speed not exceeding 15 miles per hour.

Yard Speed--A speed that will permit stopping within one-half the range of vision.

9. Day signals must be displayed from sunrise to sunset, but when day signals cannot be plainly seen, night signals must be used in addition.

Night signals must be displayed from sunset to sunrise.

19. The following signals will be displayed to the rear of every train, as markers, to indicate the rear of the train: By day, marker lamps (not lighted): By night, yellow lights to the front and side and red lights to the rear * * *

27. * * * a signal imperfectly displayed or the absence of a signal at a place where a signal is usually shown, must be regarded as the most restrictive indication that can be given by that signal * * *

* * *

A signal imperfectly displayed or the absence of a signal at a place where a signal is usually shown, must be promptly reported to the train dispatcher.

* * *

33. All members of engine and train crews must, when practicable, communicate to each other by its name the indication of each signal affecting the movement of their train or engine.

93. Within yard limits the main track may be used without protecting against second and inferior class, extra trains and engines.

Second and inferior class, extra trains and engines must move within yard limits at yard speed.

* * *

In case of accident, the responsibility will rest with the approaching train.

Note--A Proceed or Approach indication displayed by a fixed signal or by a hand, flag or lamp signal within yard limits, does not relieve train or engine-men of responsibility for observance of Rule 93. Location of yard limits are shown in time tables and by "Yard Limit" signs.

405. Enginemen must not operate the acknowledging lever of the automatic train stop until after signal indication is being obeyed.

509(a). When a train passes an automatic block signal displaying a "Proceed at restricted speed" indication, it may proceed:

(1) On any track signaled for traffic in both directions, at restricted speed through the entire block, except that when a train is proceeding under protection of a flagman from the last Stop-indication, it must continue under protection of a flagman to the next signal displaying a Proceed-indication.

* * *

In the vicinity of the point of accident the maximum authorized speed for freight trains is 50 miles per hour.

Description of Accident

Extra 2134 West, a west-bound freight train, consisted of Diesel-electric unit 2134, 33 cars, and a caboose. This train departed from John Sevier Yard at 12:30 p. m., and stopped on the main track at Lenoir City about 4:40 p. m., with the rear end 3,067 feet west of the east yard-limit sign and 3,050 feet east of the station. The locomotive was detached to perform switching service, and about 3 hours 15 minutes later the rear end of the train was struck by First 55.

First 55, a west-bound second-class freight train, consisted of Diesel-electric units 4147, 6183, and 4157, coupled in multiple-unit control, 109 cars, and a caboose. This train departed from John Sevier Yard at 6:50 p. m., 2 hours 20 minutes late, passed KY Tower, the last open office, at 7:21 p. m., passed signals 1519A and 1533A, each of which was unlighted, and while moving at a speed variously estimated as from 15 to 40 miles per hour it struck the rear end of Extra 2134 West.

The caboose and the rear four cars of Extra 2134 West were derailed. The caboose was demolished, and the rear three cars were considerably damaged. The Diesel-electric units and the first seven cars of First 55 were derailed. The underframe of the caboose of the preceding train overrode the buffer at the front end of the first Diesel-electric unit and telescoped the control compartment. The control compartment was demolished, and the unit was otherwise badly damaged. This unit became separated from the second Diesel-electric unit and stopped at an angle of about 45 degrees to the track with the front end facing east and about 40 feet south of the main track, and the rear end on the main track 120 feet west of the point of collision. The other Diesel-electric units were derailed to the north and stopped approximately in line, with the front end of the second unit immediately north of the siding 177 feet west of the point of collision and the third unit diagonally across the siding with the rear end on the main track. These units were somewhat damaged. The derailed cars stopped in various positions on or near the track. The first five cars were considerably damaged, and the sixth and seventh cars were slightly damaged.

The engineer, the fireman, and the front brakeman of First 55 were injured.

The weather was clear and it was dusk at the time of the accident, which occurred about 7:55 p. m.

Discussion

Extra 2134 West stopped on the main track within yard limits at Lenoir City about 4:40 p. m. Immediately after the train stopped the locomotive was detached and proceeded westward to perform switching service. The marker lamps at the rear of the caboose were not lighted. None of the members of the crew returned to the immediate vicinity of the rear end of the train before the accident occurred. The flagman said that when it became dusk he thought the remaining work could be completed before it would be necessary to use lamp signals. He said that if the marker

lamps had been lighted the rear end of the train would have been visible at a greater distance but he did not consider it necessary to return to the caboose for that purpose at the time. The conductor said that at the time the collision occurred members of the crew were using hand signals to control switching operations. Both the conductor and the flagman estimated that the visibility was in excess of 1,000 feet at the time the accident occurred.

As First 55 was approaching the point where the accident occurred the engineer and the front brakeman were maintaining a lookout ahead from the control compartment at the front of the locomotive. The conductor and the flagman were in the caboose. The headlight was lighted. The brakes of this train had been tested and had functioned properly when used en route. The westward signal at Boyd, 6.2 miles east of Lenoir City, and the next westward signal each indicated Proceed. According to the statement of the engineer, after the train passed Boyd the speed increased slightly on a descending grade, and it was reduced from approximately 42 to 35 miles per hour by a light service application of the brakes which was then released. Soon afterward he observed that signal 1519A was not lighted and he made a second brake application. He said that because the brake system had not been fully recharged this application failed to reduce the speed and he released the brakes, moved the brake valve to running position, and operated the acknowledging lever of the automatic train-stop apparatus immediately before the locomotive passed the signal. He thought the speed was about 20 or 25 miles per hour as the locomotive approached the yard-limit sign and he then made another application of the brakes. After the locomotive had passed the yard-limit sign he observed that signal 1533A also was unlighted. He said that he then made a further brake-pipe reduction and intentionally allowed the automatic train-stop apparatus to become actuated as the locomotive passed this signal. He estimated that the speed at this time was 12 to 15 miles per hour or slightly higher.

He said that he made an emergency application of the brakes as the locomotive was closely approaching the bridge of a highway overpass located immediately east of the east switch of the auxiliary track and before the caboose of the preceding train came into view. The front brakeman said that the members of the crew on the locomotive communicated to each other the information that signals 1519A and 1533A were unlighted and also the location of the yard-limit sign. He said that on previous occasions lights in signals had been extinguished so that crew members would communicate with the train dispatcher and could be notified of a defective condition in the equipment of their train, and when the train passed signal 1519A he told the engineer that possibly the light had been extinguished for this purpose. Telephones are located at each end of the siding and in the station at Lenoir City. The front brakeman said that no service application of the brakes was made as the train approached and entered the yard limits and that he heard the warning whistle of the automatic train-stop apparatus sound as the locomotive passed each unlighted signal, evidently as a result of operation of the forestalling device by the engineer. He estimated that the speed was about 30 miles per hour as the locomotive passed signal 1533A. He said that the engineer made an emergency application of the brakes when he and the fireman observed the rear end of the preceding train and called a warning. The fireman estimated that the speed was about 35 or 40 miles per hour as the locomotive passed signal 1533A. With this exception he agreed with the statements of the front brakeman. He said that if signal 1533A had been lighted the red aspect would have been visible a considerable distance and the accident would have been averted. He said that the caboose of Extra 2134 West would have been visible at a greater distance if the marker lamps had been lighted. The conductor and the flagman said that the brakes were applied in emergency a few seconds before the collision occurred.

The brakes of the caboose and the rear 104 cars of First 55 were tested two days after the accident occurred. All brakes applied when a brake-pipe reduction was made, and the piston travel of all cars was within the prescribed limits. The brake equipment of the locomotive was damaged and the condition immediately prior to the time of the accident could not be determined.

The power transmission line of the signal system in the vicinity of the point of accident was torn down by derailed equipment. After the line was repaired the signal apparatus was tested and functioned as intended. From the engineer's position in the control compartment of a west-bound locomotive signal 1533A is momentarily visible at a distance of 3,110 feet and is continuously visible throughout a distance of 2,180 feet immediately east of the signal.

This accident occurred within yard limits. Under the rules of this carrier First 55 was required to be operated within yard limits at yard speed. In addition, the rules require that a signal imperfectly displayed or the absence of a signal at a place where a signal usually is shown must be regarded as the most restrictive indication that can be given by that signal. The lights were extinguished in the last two signals which First 55 passed, and the train was required to be operated through the blocks of these signals at restricted speed.

When the light is extinguished in an automatic color-light signal which indicates Stop as its most restrictive indication a train must not pass the signal unless authorized by the train dispatcher. If the lights in all signals are extinguished a member of the crew of each train in the district must communicate with the train dispatcher before the train passes a stop signal, and by having the lights extinguished it is possible for the dispatcher to use this requirement as a means of stopping a train and communicating with the crew. The investigation disclosed that in the territory involved it had been a practice for a period of several years for the train dispatcher to issue instructions to the operator at

KY Tower to cut off the electric power supply to the signal system when he desired to communicate with members of the crew of a train to inform them of some defective condition of the equipment. There were no written instructions relative to this practice. The superintendent said that the electric power supply to the signal system was cut off whenever the dispatcher considered it necessary as a means of averting or minimizing the possibility of accident. On the day of the accident a lineman working on a pole line in the vicinity of Boyd observed a fire in a gondola car in the train of First 55 and reported it to the train dispatcher. The dispatcher then instructed the operator at KY Tower to cut off the electric power supply to the signal system. As a result the lights in all signals between Knoxville and Athens were extinguished as First 55 was closely approaching Lenoir City, and the signals ceased to indicate track occupancy by the preceding train.

This Commission's rules, standards, and instructions for installation, inspection, maintenance, and repair of automatic block signal systems, interlockings, traffic control systems, automatic train stop, train control, and cab signal systems, and other similar appliances, methods, and systems read in part as follows:

136.4 Interference with normal functioning of device.--The normal functioning of any device shall not be interfered with in testing or otherwise without first taking measures for insuring safety of train operation which depends on normal functioning of such device.

In the instant case the lights in all signals between Knoxville and Athens were intentionally extinguished, and the signals ceased to display the normal aspects. One of the rules of the carrier provides that a signal imperfectly displayed or the absence of a signal at a place where a signal is usually shown must be regarded as the most restrictive indication that can be given by that signal.

However, if it becomes customary for train-service employees, without written instructions or other basis for a common understanding, to interpret the absence of a light in a signal merely as an indication that they are to communicate with the train dispatcher the absence of a light may tend to lose its significance as the most restrictive indication that can be given by the signal. The investigation of this accident clearly indicated that First 55 was being operated at a rate of speed considerably in excess of that authorized by the light-out and yard limit rules.

Cause

This accident was caused by failure properly to control the speed of the following train moving within yard limits.

Dated at Washington, D. C., this twenty-seventh day of June, 1955.

By the Commission, Commissioner Clarke.

(SEAL)

HAROLD D. McCOY,

Secretary.