DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

RAILROAD SAFETY BOARD

RAILROAD ACCIDENT INVESTIGATION

REPORT NO. 4114

SOUTHERN RAILWAY COMPANY

MARCH 3, 1967

Synopsis

On March 3, 1967, a head-end collision occurred between a passenger train and a freight train on the Southern Railway at East Spartanburg, S C , resulting in injury to 15 passengers and employees

The accident was caused by an inferior train occupying the main track on the time of an opposing superior train without protection

Location and Method of Operation

The accident occurred on that part of the Charlotte-Columbia Division extending between Hayne Jct and Pacolet, S C , a distance of 13 8 miles Beaumont and East Spartanburg are 2 2 and 5 2 miles east of Hayne Jct., respectively Between Beaumont and a point 419 feet east of the East Spartanburg station, the railroad is a single-track line over which trains operate by signal indications of a traffic control system Between the end of the traffic control system at East Spartanburg and Pacolet, the railroad is a single-track line over which trains operate by timetable and train orders There is no block-signal system in use A yard-limit sign is located at the end of the traffic control system at East Spartanburg Another yard-limit sign is 4,791 feet eastward

The collision occurred on the main track, within yard

limits, 549 feet east of the East Spartanburg station and 130 feet east of the east end of the traffic control system

A spur track, which is designated as a siding, diverges from the main track at East Spartanburg as indicated in the sketch appended to this report The siding-switch is facing point for westbound movements on the main track and is 151 feet east of the collision point A take siding indicator for westbound trains is 15 feet east of the siding-switch It is controlled by the train dispatcher When the take siding indicator is illuminated, it indicates TAKE SIDING

Glendale Road crosses the siding and main track at grade, 378 feet west of the collision point

Controlled signal 171 B-L, governing westbound movements on the main track, is located at the east end of the traffic control system at East Spartanburg This signal governs the entrance of westbound movements to the traffic control system and is controlled from the traffic control machine in the train dispatcher's office

A track circuit extends about one mile east of signal 171 B-L When a train enters the circuit, a track occupancy indicator light on the track model board of the traffic control machine in the dispatcher's office becomes illuminated Occupancy of this track circuit does not affect signals of the traffic control system

Controlled signal 167R and automatic signal W-696, governing eastbound movements on the main track within the traffic control system, are 3.1 and 1 3 miles west of the east end of the traffic control system at East Spartanburg, respectively.

In the collision area, an embankment of considerable height is adjacent to the north side of the main track structure Because of track curvature and the embankment, the range of vision between a locomotive standing at the collision point and the locomotive of an approaching eastbound train is restricted to 500 feet

Details concerning the main track, signals, carrier's operating rules, trains involved, damages, and other factors are set forth in the appendix

Description and Discussion

No 28, an eastbound first-class passenger train consisting of one diesel-electric unit and four cars left Hayne, 1.0 mile west of Hayne Jct , at 2:14 p m , 29 minutes late, on the day of the accident At 2:33 p m , it stopped at Spartanburg, 1 1 mile east of Hayne Jct , where the crew members received, among others, copies of train order No 554, which read in part as follows:

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Order 549 five forty nine is annulled No 28 twenty

eight eng 4179 wait at East Spartanburg until 310
three ten p m for Work Extra 4245 and 6110 Coupled

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Under the provisions of order No 554, No 28, the superior train, was restricted from proceeding beyond the clearance point of the East Spartanburg siding-switch before 3:10 p m , unless it had passed Work Extra 4245 and 6110 Coupled at some point west of East Spartanburg, or unless Work Extra 4245 and 6110 Coupled had entered the East Spartanburg siding and cleared the main track In the event Work Extra 4245 and 6110 Coupled proceeded to East Spartanburg and did not enter the traffic control system extending between East Spartanburg and Beaumont, it was required to clear the main track for No 28 not later than 3:05 p m Failing to clear the main track at East Spartanburg by 3:05 p m , it was required to provide protection against No 28 as prescribed by Rule 99

No 28 left Spartanburg at 3:07 p m , and passed Beaumont at 3:10 p m , 53 minutes late At Beaumont it also passed signal 167R, which displayed a Diverging Route Clear aspect, and entered the traffic control system which extends eastward to East Spartanburg A few minutes later, it passed signal W-696, which displayed an Approach aspect As the train neared the East Spartanburg station, it entered the 6°00'curve on which the collision occurred and on which the maximum authorized speed is restricted to 20 miles per hour At this time, the train was moving at 20 to 40 miles per hour, according to various estimates of the crew members As it moved on the curve and neared the Glendale Road crossing at East Spartanburg, the engineer sounded the prescribed signal on the locomotive horn About the same time, he and the fireman looked toward the East Spartanburg siding to determine whether it was occupied by Work Extra 4245 and 6110 Coupled On observing that the siding was unoccupied, they assumed the opposing work train extra had probably cleared the main track for their train at Camp Croft, 2 1 miles east of East Spartanburg Both the engineer and fireman stated that soon afterward, as their locomotive moved over the Glendale Road crossing, they suddenly saw the locomotive of Work Extra 4245 and 6110 Coupled standing on the main track, in the curve, a short distance ahead The engineer promptly initiated an emergency application of the train brakes, then laid on the floor of the locomotive control compartment The fireman descended the ladder on the engineer's side of the control compartment and alighted from the locomotive Immediately afterward, at 3:17 p m , when its speed had been reduced to between 10 and 20 miles per hour, as estimated by its crew members, No 28 collided with Work Extra 4245 and 6110 Coupled, 549 feet west of the East Spartanburg station and 151 feet east of the siding-switch The engineer of No 28 said that the radio apparatus in the control compartment of his locomotive was operative, and that he did not hear any radio communication concerning the movement of Work Extra 4245 and 6110 Coupled while his train approached the collision point

The fireman, conductor, train baggageman, two railway post office employees and nine passengers of No 28, and the flagman of Work Extra 4245 and 6110 Coupled, were injured

Work Extra 4245 and 6110 Coupled was on a regularly assigned local freight run, operating from Hayne to Pacolet and return The flagman, whose normal occupation was that of a yard brakeman at Hayne, was filling an emergency vacancy on the crew The front brakeman was relatively inexperienced, having been employed by the carrier for about five months The conductor, engineer, and fireman had considerable train-service experience Work Extra 4245 and 6110 Coupled departed eastward from Hayne at 8:35 a m. the day of the accident and arrived at Pacolet at 1:10 p m It left Pacolet, for the return trip to Hayne, at 2:20 p.m. Before leaving, the crew members received copies of train order No 549, which read in part as follows:

> No 28 Twenty Eight Eng 4179 Wait at East Spartanburg until 250 two fifty p m

The work extra train proceeded westward to Camp Croft, arriving there at about 2:30 p m It then entered the Camp Croft siding to clear the main track for No 28 and to perform switching operations.

Shortly before 2:40 p m , the conductor entered the Camp Croft station to obtain additional information concerning the movement of No 28 The dispatcher was transmitting train order No 554 to the Camp Croft operator at this time, and the operator informed the conductor that the order annulled order No 549 and required No 28 to wait at East Spartanburg until 3:10 p m for his train The conductor said the operator also informed him that if his train could leave Camp Croft by 3:00 p m , the dispatcher "intended to run you in for 28 " This indicated to the conductor that if his train left Camp Croft by 3:00 p m., the dispatcher would permit it to enter the traffic control system extending between East Spartanburg and Beaumont and would establish the route for it to meet No 28 within limits of the traffic control system. At 2:40 p m , train order No 554 was made "complete" to the operator, who then provided the conductor with copies of the order About 10 or 15 minutes later, when the switching operations were almost completed, the conductor boarded the locomotive and gave the engineer a copy of order No 554 In addition, he told the engineer, fireman, and flagman that the "dispatcher was going to get us in for 28." This indicated to the engineer that the dispatcher would permit Work Extra 4245 and 6110 Coupled to enter the traffic control system at East Spartanburg and would establish the route for it to meet No 28 within limits of the traffic control system When the front brakeman boarded the locomotive, the engineer informed him of what the conductor had said Neither the front brakeman nor the flagman read train order No 554, as required. It was their understanding, from what the conductor had told the engineer, that the dispatcher would hold No 28 at some point within limits of the traffic control system to meet their train The conductor, engineer, and fireman read the

train order and understood its requirements

Work Extra 4245 and 6110 Coupled, consisting of 2 diesel-electric units and 33 cars without a caboose, left Camp Croft at 3:02 p m , as indicated by the dispatcher's record of train movements The engineer, fireman, front brakeman, and flagman were in the control compartment of the first diesel-electric unit, and the conductor was in the control compartment of the second unit The train brakes had not been tested, as required by the Power Brake Law of 1958 The engineer said that while en route westward from Camp Croft to East Spartanburg, a distance of 2 1 miles, he called the dispatcher by radio several times to inform him that the train was nearing the east end of the traffic control system and signal 171 B-L, which displayed a Stop aspect, but the dispatcher did not respond to the calls The engineer said he then attempted to relay this information to the dispatcher via the operator at Hayne, but the operator also did not respond to the radio calls Soon after leaving Camp Croft, the work extra train entered the track circuit in approach to signal 171 B-L, causing the track occupancy indicator light on the track model board of the traffic control machine in the dispatcher's office to become illuminated It then passed the east yard-limit sign at East Spartanburg. About this time, the thought occurred to the engineer that the dispatcher might have decided not to have No 28 meet Work Extra 4245 and 6110 Coupled within limits of the traffic control system and, instead, desired the latter train to enter the East Spartanburg siding for the meet with No 28 However, while nearing the siding-switch he saw that the take siding indicator associated with the switch was not illuminated This indicated to him that the dispatcher did not desire the work train extra to enter the East Spartanburg siding to meet No 28 It also indicated to him that the dispatcher would clear signal 171 B-L and would establish the route for the work extra train to meet No 28 within limits of the traffic control system The locomotive then passed the take siding indicator and the East Spartanburg siding-switch Immediately thereafter, at 3:07 p m , three minutes before the time shown in train order No. 554 and two minutes after it was required to clear the main track for No 28, Work Extra 4245 and 6110 Coupled stopped on the main track with the front end 130 feet west of the east end of the traffic control system and signal 171 B-L, which continued to display a Stop aspect

After the train stopped, the crew members waited for the dispatcher to cause signal 171 B-L to display a proceed aspect and thereby authorize their train to enter the traffic control system Believing that the dispatcher was going to establish the route for their train to meet No 28 within limits of the traffic control system, the engineer and conductor assumed there was no need to clear the main track for No 28 at East Spartanburg, or to provide protection against that train Hence, they made no attempt to clear the main track for No. 28 or to provide protection against that train, as required by rule. About 3:17 p m while Work Extra 4245 and 6110 Coupled was standing short of signal 171 B-L without protection, the crew members heard the locomotive horn of No 28 sounding for the Glendale Road

crossing at East Spartanburg. A few moments later, apparently when the approaching train came into view on the 6°00' curve, they realized it was about to collide with their train They promptly alighted from the locomotive, and the collision occurred immediately afterward

The Camp Croft operator said she could not recall having informed the conductor of Work Extra 4245 and 6110 Coupled that if his train left Camp Croft by 3:00 p m , the dispatcher intended to establish the route for it to enter the traffic control system and to meet No 28 within limits of that system According to her statements, shortly after the work extra arrived at Camp Croft she advised the dispatcher that the provisions of train order No 549 did not provide the work extra train sufficient time to proceed to East Spartanburg for No 28 After ascertaining from the conductor that his train would be ready to leave Camp Croft at approximately 3:00 p m , she relayed this information to the dispatcher who then issued order No 554. The operator said she asked the conductor if the provision of this order would provide sufficient time for his train to proceed to East Spartanburg and enter the traffic control system, and he replied that he thought it would She said Work Extra 4245 and 6110 Coupled left Camp Croft at 3:02 p m , and she reported its departure to the dispatcher about two or three minutes later

In the territory involved, trains operate over two train dispatching districts, which meet at the East Spartanburg siding-switch The dispatcher for the territory between Pacolet and East Spartanburg transmitted order No 554 to the Camp Croft operator In essence, his statements relating to the circumstances surrounding the issuance of that order agreed with those of the operator He said that he did not have any communication with the conductor regarding the movement of work train extra under the provisions of order No 554, and that he did not have any conversation with either the operator or conductor as to where he expected the work train extra to meet No 28 The train dispatcher for the traffic control system extending between Beaumont and East Spartanburg had been informed by the other dispatcher of the issuance of order No 554 He said that on two or three occasions prior to 3:10 p m , the other dispatcher came over to the track model board associated with the traffic control machine to determine whether Work Extra 4245 and 6110 Coupled had entered the track circuit extending about one mile east of signal 171 B-L This indicates the dispatcher for the traffic control system was aware of the possibility that the work extra train would proceed from Camp Croft to East Spartanburg under the provisions of train order No 554 According to his statements, however, the dispatcher for the traffic control system did not know that Work Extra 4245 and 6110 Coupled had left Camp Croft and had proceeded to East Spartanburg until after the accident, when he first noticed that the model-board track occupancy indicator light associated with the track circuit extending east of signal 171 B-L was illuminated He said he had not heard any radio calls from the work extra train while it was en route from Camp Croft to East Spartanburg

He further said within two or three minutes before or after 3:00 p.m , he established the route for No 28 to proceed within the traffic control system to East Spartanburg

According to statements by employees involved in the accident, train dispatchers have frequently issued orders such as order No 554 to trains on the local freight run, to permit those trains to proceed from Camp Croft to East Spartanburg to enter the traffic control system and meet No 28 within the limits of that system

Because of conflicting statements, it could not be determined whether either of the train dispatchers involved had informed the conductor of Work Extra 4245 and 6110 Coupled that if his train left Camp Croft by 3:00 p.m , the route would be established for it to pass signal 171 B-L and to meet No 28 within limits of the traffic control system. The investigation disclosed, however, it is a common practice to issue orders such as No 554 to work extras on the local freight run so that they may proceed from Camp Croft to East Spartanburg, enter the traffic control system, and meet No 28 in accordance with signal indications of that system If the work extra is able to reach East Spartanburg five minutes before the time shown in the train order, it is authorized to proceed westward from Camp Croft to East Spartanburg If signal 171 B-L displays a proceed aspect, the work extra is authorized to enter the traffic control system and to continue westward After passing signal 171 B-L, it is protected against No 28 by signal indications of the traffic control system

Findings

Train order No 554 required No 28 to wait at East Spartanburg until 3:10 p m for Work Extra 4245 and 6110 Coupled It is evident in this case that the work extra left Camp Croft at 3:02 p m and that it had insufficient time to proceed to East Spartanburg and to enter the traffic control system five minutes before the time shown in order No. 554, as required. It is also evident that it had insufficient time to proceed to East Spartanburg and clear the main track there for No 28 by 3:05 p m , as required by rule, under the provisions of order No 554. Work Extra 4245 and 6110 Coupled stopped on the main track at East Spartanburg at approximately 3:07 p m , two minutes after it was required to be clear of the main track for No 28, and it was unable to enter the traffic control system because of the Stop aspect displayed by signal 171 B-L Because the crew members thought the dispatcher would clear signal 171 B-L and establish the route for their train to meet No 28 within the traffic control system, they erroneously assumed it was not necessary for it to clear the main track for No 28 at East Spartanburg or to provide protection against that train Hence, they made no attempt to provide protection for their train or to clear the main track for No 28, as required, resulting in the accident

As No 28 proceeded on the curve involved and neared the collision point, it was apparently moving somewhat in

excess of 20 miles per hour, the maximum authorized speed on the curve. Had the train been moving on the curve at 20 miles per hour or less and had the enginemen observed Work Extra 4245 and 6110 Coupled standing on the main track ahead at the maximum range of vision, 500 feet, and immediately applied the brakes in emergency, No 28 could probably have been stopped short of the collision point.

Court proceedings have been instituted against the Southern Railway Company for the violation of the Power Brake Law, as disclosed in this case.

Cause

This accident was caused by an inferior train occupying the main track on the time of an opposing superior train without protection.

Dated at Washington, D. C., this 8th day of August 1967
By the Federal Railroad Administration
Railroad Safety Board.

Bette E. Holt
Acting Executive Secretary

(SEAL)

Appendix

Track

From the east on the main track there are, in succession, a long tangent, and a compound curve to the right, having a maximum curvature of 6°00', 151 feet to the collision point and 969 feet westward From the west there are successively, a short tangent and the curve on which the collision occurred. The grade is practically level in the collision area.

Signals

Signals 167R, W-696, and 171 B-L are of the color-light type and are continuously lighted. The aspects applicable to this investigation and the corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
167R	Red-over-green	Proceed through Diverging Route ***	Diverging Route Clear
W-696	Yellow	Proceed, Preparing To Stop At Next Signal Train Exceeding Medium Speed Must at Once Reduce To That Speed	Approach
171 B-L	Red-over-red	Stop	Stop

The circuits are so arranged that when the train dispatcher has established the route for an eastbound train to proceed from Beaumont to the east end of the traffic control system at East Spartanburg, and the blocks of signals 167R and W-696 are unoccupied, westward signal 171 B-L indicates Stop and eastward signals 167R and W-696 display Diverging Route Clear and Approach aspects, respectively.

Carrier's Operating Rules

EXTRA TRAIN - A train not authorized by a time table schedule It may be designated as —

***

WORK EXTRA - for work train extra

REGULAR TRAIN - A train authorized by a time table schedule

SPEED:

***

MEDIUM SPEED - A speed not exceeding 30 miles per hour

SUPERIOR TRAIN - A train having precedence over another train

73. Extra trains are inferior to regular trains.

S-87. An inferior train must keep out of the way of opposing superior trains and failing to clear the main track by the time required by rule must be protected as prescribed by Rule 99.

Extra trains must clear the time of opposing regular trains not less than five minutes unless otherwise provided, ***

99 ***

***

Where necessary the front of the train must be protected immediately by the forward trainmen, or other competent employee

204 ***

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Enginemen must show train orders and clearance cards, when practicable, to forward trainmen Conductors must show train orders and clearance cards, when practicable, to trainmen

Trainmen will keep orders in mind and, should conditions require, call attention of conductors and enginemen to their contents

FORMS OF TRAIN ORDERS

S-E

(1) No 1 one eng 1860 wait at H until 959 nine fifty nine a m for No 62 sixty two eng 787

The train first named must not pass the designated point before the time given, unless the other train has arrived The train last named is required to run with respect to the time specified, at the designated point or any intermediate station where schedule time is earlier than the time specified in the order, as before required to run with respect to the schedule time of the train first named.

Trains Involved

No. 28 consisted of car-body type diesel-electric unit 4179, 1 railway post office car, two baggage cars and 1 coach, in that order. The cars were of all-steel construction The train brakes had been tested and had functioned properly The headlight was lighted brightly As this train approached the collision point, the engineer and fireman were in the control compartment at the front of the locomotive The other crew members were in the fourth car

Work Extra 4245 and 6110 Coupled consisted of car-body

type diesel-electric units 6110 and 4245, coupled in multiple-unit control and 33 cars, in that order. There was no caboose. This train had picked up 29 cars at Camp Croft and the train brakes were not tested, as prescribed by the Power Brake Law of 1958, before leaving that point.

Damages

No. 28 stopped with the front end against the front of the locomotive of Work Extra 4245 and 6110 Coupled No equipment of either train was derailed, and there were no separations. The underframe at the east end of the locomotive of No. 28 and the underframes at the west ends of the diesel-electric units of the work extra were buckled slightly The locomotive units of both trains were considerably damaged. The first car of No. 28, and the fifth, sixth and seventh cars of Work Extra 4245 and 6110 Coupled, were slightly damaged.

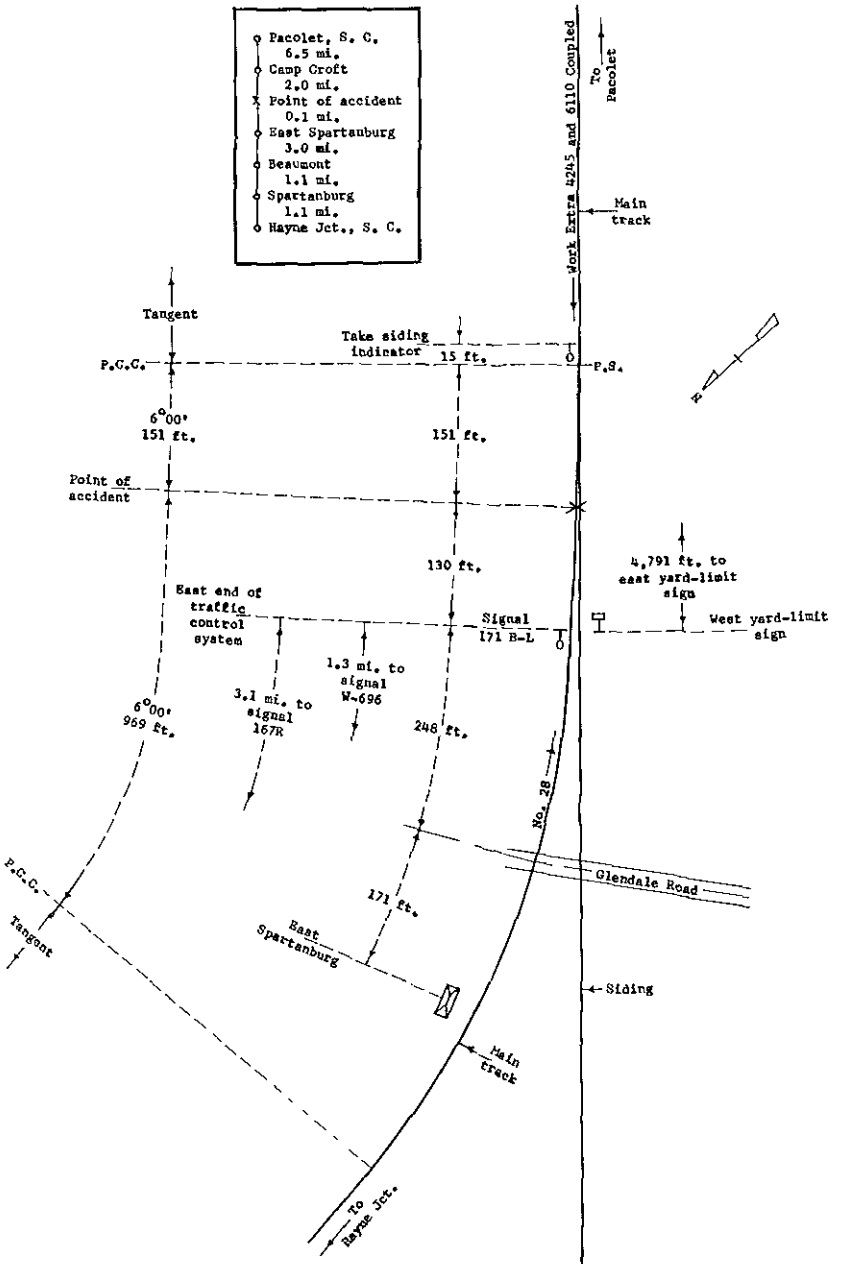
Other Factors

The accident occurred at 3:17 p.m., in clear weather

The maximum authorized speed for passenger trains in the territory involved is 55 miles per hour, but is restricted to 20 miles per hour on the curve where the collision occurred.

The engineer and fireman of No. 28 had been on duty 2 hours 2 minutes when the collision occurred, after having an off-duty period of 22 hours 30 minutes. The conductor flagman, and train baggageman had been on duty 4 hours 27 minutes, after having been off duty 17 hours 40 minutes

All the crew members of Work Extra 4245 and 6110 Coupled had been on duty 7 hours 47 minutes at the time of the accident. The engineer and fireman had previously been off duty 15 hours 50 minutes; the conductor 15 hours 45 minutes; the front brakeman 15 hours 50 minutes, and the flagman 32 hours.



Southern Railway
East Spartanburg, S. C.
March 3, 1967

GPO 929-635