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INTERSTATE COMMERCE COMMISSION.
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INVESTIGATION NO. 2751
THE ATLANTIC COAST LINE RAILROAD COMPANY
REPORT IN RE ACCIDENT
NEAR RENNERT, N. C., ON
DECEMBER 16, 1943

SUMMARY

Railroad: Atlantic Coast Line
Date: December 16, 1943
Location: Rennert, N. C.
Kind of accident: Side collision
Trains involved: Passenger : Passenger
Train numbers: 91 : 8
Engine numbers: Diesel-electric : Diesel-electric
units 515-753-514 : units 506-503-500
Consist: 18 cars : 16 cars
Estimated speed: Standing : 80 m. p. h.
Operation: Timetable, train orders and
automatic block-signal and
automatic train-stop system
Track: Double; tangent; 0.42 percent
descending grade northward
Weather: Clear
Time: About 1:30 a. m.
Casualties: 72 killed; 187 injured
Cause: Failure to provide adequate
protection for derailed cars
which fouled adjacent main track

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2751

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

THE ATLANTIC COAST LINE RAILROAD COMPANY

January 18, 1944.

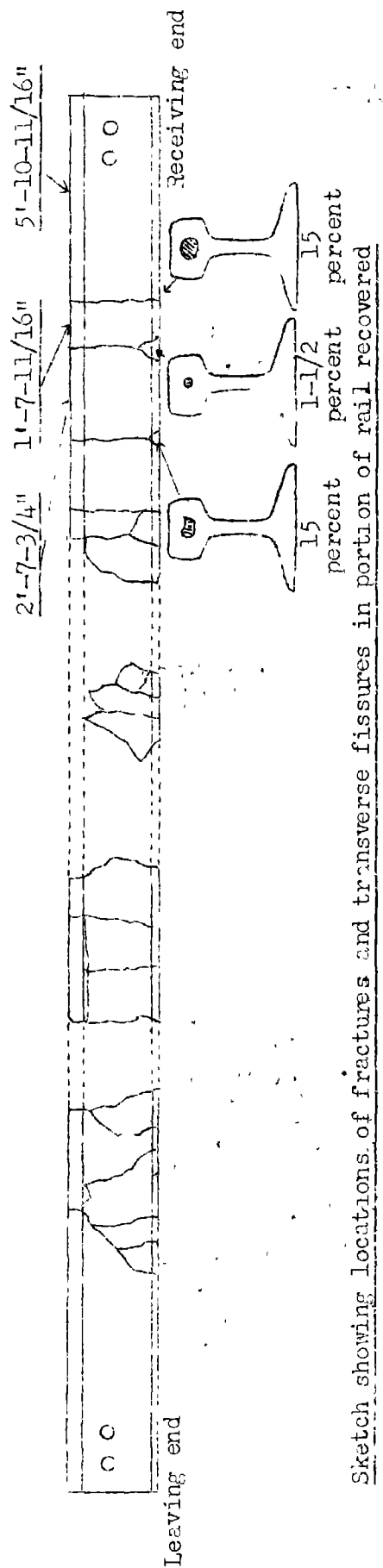
Accident near Rennert, N. C., on December 16, 1943, caused
by failure to provide adequate protection for derailed
cars which fouled adjacent main track.

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REPORT OF THE COMMISSION

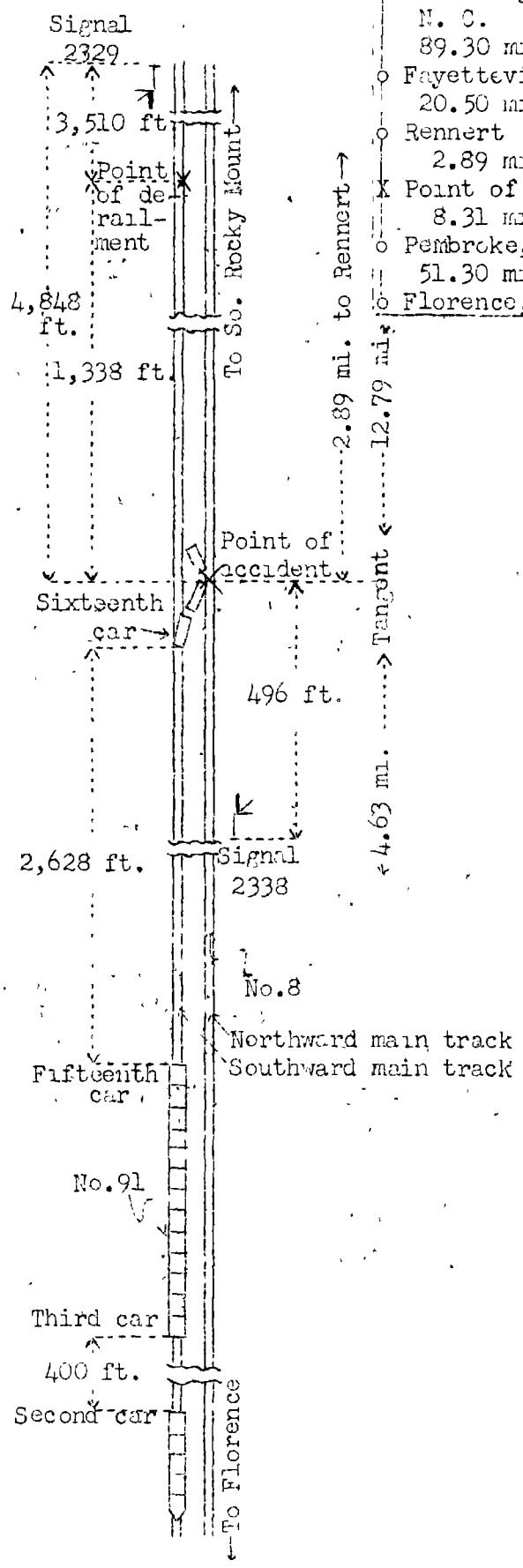
PATTERSON, Chairman:

On December 16, 1943, there was a side collision between derailed cars of a passenger train and a passenger train on the Atlantic Coast Line Railroad near Rennert, N. C., which resulted in the death of 72 passengers, and the injury of 160 passengers, 15 Pullman employees, 9 dining-car employees, 1 coach attendant, 1 train porter and 1 train-service employee. This accident was investigated in conjunction with a representative of the North Carolina Utilities Commission.

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



Sketch showing locations of fractures and transverse fissures in portion of rail recovered



- So. Rocky Mount, N. C. 89.30 mi.
- Fayetteville 20.50 mi.
- Rennert 2.89 mi.
- X Point of accident 8.31 mi.
- Pembroke, N. C. 51.30 mi.
- Florence, S. C.

Inv. No. 2751
 Atlantic Coast Line Railroad
 Rennert, N. C.
 December 16, 1943

Location of Accident and Method of Operation

This accident occurred on that part of the Richmond District extending between South Rocky Mount, N. C., and Florence, S. C., 172.3 miles. This was a double-track line over which trains moving with the current of traffic were operated by timetable, train orders, and an automatic block-signal and automatic train-stop system. The trains involved were being operated with the current of traffic, and the accident occurred about 2.89 miles south of Rennert. The main tracks were tangent throughout a distance of 4.63 miles south of this point and 12.79 miles northward. The grade for north-bound trains was 0.42 percent descending.

In this vicinity the tracks were laid in a cut, the banks of which rose to a maximum height of 7 feet. The track structure consisted of 100-pound rail, 39 feet in length, laid in 1937 on an average of 24 treated ties to the rail length. It was fully tieplated, single-spiked, provided with 4-hole angle bars and an average of 4 rail anchors per rail length, and was ballasted to a depth of 8 inches with crushed stone.

Automatic signal 2329, governing south-bound movements on the southward main track, and automatic signal 2338, governing north-bound movements on the northward main track, were located, respectively, 4,848 feet north and 496 feet south of the point of accident.

DEFINITIONS

* * *

Restricted Speed.--Proceed prepared to stop short of train, obstruction, or anything that may require the speed of a train to be reduced.

* * *

Operating rules read in part as follows:

7. Employees whose duties may require them to give signals, must provide themselves with the proper appliances, keep them in good order and ready for immediate use.

11. A fusee on or near the track burning red must not be passed until burned out, except in territory governed by automatic signals where train will come to a full stop and proceed at restricted speed to the next automatic signal.

12. Hand, Flag and Lamp Signals

Note: The hand, or a flag, moved the same as the lamp, * * *, gives the same indication.

Manner of Using	Indication	* * *
(a) Swung across the track.	Stop.	* * *

* * *

(e) Swung vertically in a circle at arm's length across the track when the train is running.	Train has parted.	* * *
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* * *

(h) Any object waved violently by any one on or near the track is a signal to stop.

* * *

D-14. ENGINE WHISTLE SIGNALS

Note--The signals prescribed are illustrated by "o" for short sounds; "___" for longer sounds. * * *

Sound	Indication
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* * *

(f) ___ ___ ___	When running, train parted; to be repeated until answered by the signal prescribed by Rule 12 (e). * * *
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* * *

15. The explosion of two torpedoes is a signal to reduce speed and look out for a train ahead or obstruction. The explosion of one torpedo will indicate the same as two, but the use of two is required.

D-17. The headlight will be displayed to the front of every train by night. * * *

It must be dimmed * * * on two or more tracks when approaching trains in the opposite direction.

* * *

35. The following signals will be used by flagmen:

* * *

Night signals - A red light.
A white light.
Torpedoes and
Fuseses.

99. When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure full protection, placing two torpedoes, and when necessary, in addition, displaying lighted fuseses.

* * *

The front of the train must be protected in the same way when necessary by the Fireman.

* * *

D-102. If a train should part while in motion, trainmen must, if possible, prevent damage to the detached portions. The signals prescribed by Rules 12 (e) and 14 (f) must be given.

The detached portion must not be moved or passed until the front portion comes back.

The engineman and trainmen of the front portion must give the train-parted signal to trains running on an adjacent track. A train receiving this signal or being otherwise notified that a train on an adjacent track has parted, must immediately reduce speed and proceed at restricted speed until the separated train is passed.

In case of sudden stops of trains when the cause is not definitely known, fireman or head brakeman must immediately protect trains on other track until it is known that such track is unobstructed. In such case flagman in a similar way must protect both tracks in the rear.

ENGINEMEN

992. When it is necessary to protect the front of the train they must see that the Fireman performs his duty promptly, as required by Rule 99.

FIREMEN

1005. They must be familiar with the Train Rules that apply to the protection of their trains; and must understand the use of signals, and be prepared to use them promptly, as per Rule 99.

The maximum authorized speed for the trains involved was 90 miles per hour.

Description of Accident

No. 91, a south-bound first-class passenger train, consisted of Diesel-electric units 515, 753 and 514, 2 express cars, 1 mail car, 1 passenger-baggage car, 1 coach, 1 dining car, 1 tavern car, 4 coaches, 1 Pullman sleeping car, 1 lounge car, 3 Pullman sleeping cars, 1 dining car and 1 Pullman sleeping car, in the order named. The cars were of steel construction. This train departed from Fayetteville, 20.5 miles north of Rennert and the last open office, at 12:25 a. m., 1 hour 5 minutes late, passed Rennert, passed signal 2329, which displayed proceed, and while it was moving at a speed of about 85 miles per hour the rear three cars, the sixteenth, seventeenth and eighteenth, were derailed to the left at a point 3,510 feet south of signal 2329. The derailed cars remained upright, but became separated from the front portion of the train, continued in line with the track a distance of 1,338 feet southward and stopped about 12:50 a. m. with the rear two cars fouling the northward main track.

No. 8, a north-bound first-class passenger train, consisted of Diesel-electric units 506, 503 and 500, 1 passenger-baggage car, 2 coaches, 4 Pullman sleeping cars, 1 dining car and 8 Pullman sleeping cars, in the order named. The cars were of steel construction. This train passed Pembroke, 11.2 miles south of Rennert and the last open office, at 1:20 a. m., 1 hour 40 minutes late, passed signal 2338, which displayed proceed, and about 1:30 a. m. while moving at a speed of about 80 miles per hour it struck the derailed cars of No. 91.

The sixteenth car of No. 91 was slightly damaged, the seventeenth car was considerably damaged, and the front portion of the left side of the rear car was crushed inward approximately 3 feet throughout a distance of about 30 feet. The

Diesel-electric units and the first eight cars of No. 8 were derailed to the right and stopped east of the track, with the front end of unit 506 about 590 feet north of the point of collision. The Diesel-electric units remained coupled, the front portion of the left side of unit 506 was considerably damaged, and units 503 and 500 were slightly damaged. The first car stopped upright behind unit 500, and was considerably damaged. The second car became separated from the first car and stopped upright against the left sides of unit 500 and the first car. The third car stopped on top of the second car, and these cars were demolished. The fourth car stopped upright with the front end against the left sides of the second and third cars, and the rear end on the track. The fifth car stopped upright with the front end against the rear end of the fourth car, and the rear end about 40 feet east of the track. The sixth car stopped upright with the front end against the left side of the fifth car, and the rear end on the track. The seventh and eighth cars stopped upright on the roadbed and in line with the track. The fourth to the eighth cars, inclusive, were considerably damaged. One fatality occurred in the rear car of No. 91 as a result of the collision, and most of the other fatalities occurred in the second and third cars of No. 8.

The Diesel-electric units of both trains were equipped with tight-lock couplers and trucks having self-locking center pins. The fourth, sixth, seventh and seventeenth cars of No. 91, and the fifth and eighth cars of No. 8 were equipped with tight-lock couplers. All cars except the first, second, sixteenth and seventeenth cars of No. 91, and the seventh car of No. 8 were equipped with self-locking center pins.

The rail involved was a 39-foot, 100-pound AREA, open hearth rail, manufactured by the Tennessee Coal, Iron and Railroad Company in 1937, and laid in the track during the same year. The heat number was 890707, Letter A.

It was clear at the time of the accident, which occurred about 1:30 a. m.

The employee injured was the flagman of No. 8.

Discussion

No. 91 was moving on tangent track at a speed of about 85 miles per hour in territory where the maximum authorized speed was 90 miles per hour when the rear truck of the sixteenth car, and the seventeenth and the eighteenth cars were derailed. The Diesel-electric units and the first fifteen cars became separated from the rear three cars. The rear portion of the train stopped with the front end of the sixteenth car about 1,300 feet south of the point of derailment. The seventeenth and the eighteenth cars fouled the northward main track. The front portion of the train stopped with the rear end of the fifteenth

car about 2,600 feet south of the front end of the sixteenth car. Prior to the time of the derailment the engines and the cars of No. 91 were riding smoothly, and there was no indication of defective equipment or track, nor of any obstruction having been on the track. The last automatic signal that No. 91 passed displayed proceed.

After the accident a broken rail was found on the east side of the southward main track. The rail was broken into many pieces, 64 of which were recovered. The pieces were scattered throughout a distance of about 400 feet south of the point of derailment. The first break occurred between two ties at a point 5 feet 10-11/16 inches south of the receiving end of the rail. This piece of rail remained in normal position. At the first break there was a transverse fissure covering about 15 percent of the cross-sectional area of the head of the rail. At the second and third breaks, which occurred at points 7 feet 6-3/8 inches and 10 feet 2-1/8 inches south of the receiving end, there were transverse fissures covering, respectively, 1-1/2 percent and 15 percent of the cross-sectional area of the head. None of these fissures had progressed to the outer surface. Wheel marks on the rail at the south end of the third broken section indicated that the derailment occurred at that point. The other breaks in the rail appeared to have resulted during the derailment. Since the first automatic signal north of the broken rail displayed proceed and no abnormal condition of the track was felt when the front portion of No. 91 passed the point where the derailment occurred, it is apparent that the rail broke under the train. The track involved was last inspected by the section foreman from his motor-car on December 13, 1943, and no defective condition was found. A detector car was last operated over the track in this vicinity on October 17, 1943.

As No. 8 was approaching the point where the accident occurred the speed was about 85 miles per hour. The headlight was lighted brightly and both engineers were maintaining a lookout ahead. There was no condition of the engine that distracted their attention or obscured their view of the track ahead. The last automatic signal passed by No. 8 displayed proceed. The engineers first saw the reflection of the headlight of No. 91 about 4 miles distant. When No. 8 was a few hundred feet south of the front end of No. 91 the engineers of No. 8 saw a stationary red light immediately in front of No. 91, but no warning signal was seen or heard from the time the reflection of the headlight became visible until after the front end of No. 8 passed the front end of No. 91, then the engineer of No. 8 saw stop signals being given from a point between the rails of the northward main track about 1,000 feet distant, and simultaneously he saw the derailed cars. He immediately moved the brake valve to emergency position, but he was unable to stop his train in time to avert the collision. A passenger of No. 91 said that he procured one of the lighted

marker lamps from the rear car of No. 91 and was giving stop signals with it from a point about 1,000 feet south of the derailed cars when No. 8 passed him.

When No. 91 stopped after the derailment occurred, the enginemen were in the control compartment of the first Diesel-electric unit, the baggageman and the train porter were in the fourth car, the conductor was in the thirteenth car and the flagman was in the rear car. The first they were aware of anything being wrong was when the brakes became applied in emergency. Immediately after the derailment occurred the flagman observed that the rear three cars were detached from the train and that the rear two cars fouled the northward main track. He placed a lighted 10-minute fusee in front of the most southward car, and gave signals with a lighted white lantern to indicate to the other members of the crew that the train had parted. A passenger questioned the flagman about providing protection on the northward main track and he informed the passenger that a member of the crew on the front end of the train would furnish proper protection. Then the flagman proceeded northward to furnish flag protection. About 30 minutes later, he informed the engine crew of a following freight train of the derailment, and instructed them to detach their engine and to proceed with him to the location of the derailed cars. While this engine was moving toward the point of derailment, No. 8 struck the derailed cars. The conductor said that when his train stopped he immediately looked toward the rear and saw a lighted fusee, but did not see any signals being given by the flagman nor lighted marker lamps at the rear end of his train. He was not aware that any part of the train was derailed and he thought the lighted fusee he saw had been dropped from the rear car, and that his train was intact. He saw a large volume of steam escaping from the vicinity of the front end of the train, and he proceeded southward. When he reached the front end of the third car he observed that a coupler knuckle on this car was broken and that the third car was separated from the second car a distance of about 400 feet. Soon afterward he saw a member of the crew proceeding southward with a lighted red lantern, and he assumed that proper flag protection was being furnished on the northward main track south of the front end of his train. The engineer said that soon after the train stopped he instructed the fireman to provide flag protection on the northward main track. The engineer and the baggageman assisted the conductor in replacing the broken knuckle. They said that, although they were not aware that any part of their train was derailed, they had seen the fireman proceeding southward and they thought proper flag protection was being furnished. After the broken knuckle was replaced, the second and third cars were recoupled, then it was found that the coupler on the front end of the first car was broken. The engineer and the baggageman were engaged in chaining this car to the rear Diesel-electric

unit, and the conductor and the train porter were attempting to communicate with the train dispatcher, from a portable telephone which they had connected to the dispatcher's circuit east of the track near the front end of No. 91, when No. 8 passed. The fireman said that soon after his train stopped he proceeded southward to provide flag protection on the northward main track. He had a lighted white lantern and a lighted red lantern and one fusee, but he forgot to take a supply of torpedoes. There was an ample supply of torpedoes and fusees on the engine. When he saw the reflection of the headlight of a train approaching from the south he was about 100 feet south of the front end of his train. He immediately attempted to light the fusee, but, because of snow on the ballast, he slipped and fell and broke the fusee in such a manner that it could not be ignited. He then gave stop signals with the lighted red lantern, but No. 8 passed him at a speed of about 85 miles per hour, and there was no indication that his lantern signals had been seen by the enginemen.

The operating rules of this carrier provide that when a train is stopped suddenly and the cause is not definitely known, adjacent tracks that might be obstructed must be protected at once in both directions until it is ascertained they are safe and clear for movement of trains. The members of the crew of No. 91 understood these requirements. A period of approximately 40 minutes elapsed between the derailment of the south-bound train and the collision between the north-bound train and the derailed cars. This period afforded ample time in which to provide flag protection in both directions. Protection was furnished at the rear end of this train by the flagman, but the fireman failed to provide himself with torpedoes and a sufficient supply of fusees with which to furnish adequate protection. Although the fireman stated that he gave stop signals with a lighted red lantern, these signals were not given from a position where they were visible to the enginemen of No. 8.

In connection with this accident, the Commission has received many suggestions for the use of various devices to provide protection for trains under conditions similar to those existing after No. 91 was derailed. These suggestions included the use of a two-way radio system to provide means of communication between members of the crews at each end of a train and also between the crews of trains closely approaching each other, an arrangement for displaying a red light to the front of a train stopped under abnormal conditions, a bar or a wire to shunt the track circuit so that automatic signals would display restrictive indications; and rocket signals to display warning lights. These suggestions were predicated upon the assumption that members of the crew of No. 91 knew that the rear portion of their train was fouling the northward track. However, the flagman was the

only member who knew about the derailed cars, but he was required to go to the rear immediately to protect his train. If the members of the crew at the front end had at once provided adequate flag protection and had then made a thorough inspection of their train, as was necessary under the conditions at the time the train stopped, they would have learned that the rear two cars were obstructing the other track and that further flag protection was required. However, the employees on the forward portion of the train assumed the separation between the second and third cars to be the only condition that caused the emergency application of the brakes. The fireman did not provide himself with full flagging equipment, which would have been adequate to prevent the accident if used in accordance with the rules, and no other member of the crew gave adequate attention to the extent of the flag protection being provided. If any or all of the suggested devices had been provided, it is not probable any of them would have been used as the members of the crew at the front end assumed there was nothing wrong except one separation in their train. If they had furnished proper flag protection and had made a thorough inspection of the train, the collision between the north-bound train and the derailed cars could have been prevented.

Cause

It is found that this accident was caused by failure to provide adequate protection for derailed cars which fouled an adjacent main track.

Dated at Washington, D. C., this eighteenth day of January, 1944.

By the Commission, Chairman Patterson.

(SEAL)

W. P. BARTEL,
Secretary.