

INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2591

THE SEABOARD AIR LINE RAILWAY COMPANY

REPORT IN RE ACCIDENT

NEAR RYAN, VA., ON

MAY 28, 1942

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SUMMARY

Railroad: Seaboard Air Line

Date: May 28, 1942

Location: Ryan, Va.

Kind of accident: Head-end collision

Trains involved: Passenger : Freight

Train numbers: 10 : Extra 443-451 South

Engine numbers: Diesel-electric : 443-451
3008-3012

Consist: 7 cars : caboose

Speed: 30-35 m. p. h. : 15-25 m. p. h.

Operation: Centralized-traffic-control system

Track: Single; tangent; 0.58 percent
ascending grade northward

Weather: Clear

Time: About 8:55 a. m.

Casualties: 68 injured

Cause: Accident caused by No. 10 overrunning
a stop signal after it had accepted
a proceed indication at the approach
signal which should have displayed
an imperfect indication, under a
system of train operation by signal
indication only

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2591

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

THE SEABOARD AIR LINE RAILWAY COMPANY

August 24, 1942.

Accident near Ryan, Va., on May 28, 1942, caused by No. 10
overrunning a stop signal after it had accepted a
proceed indication at the approach signal which should
have displayed an imperfect indication, under a system
of train operation by signal indication only.

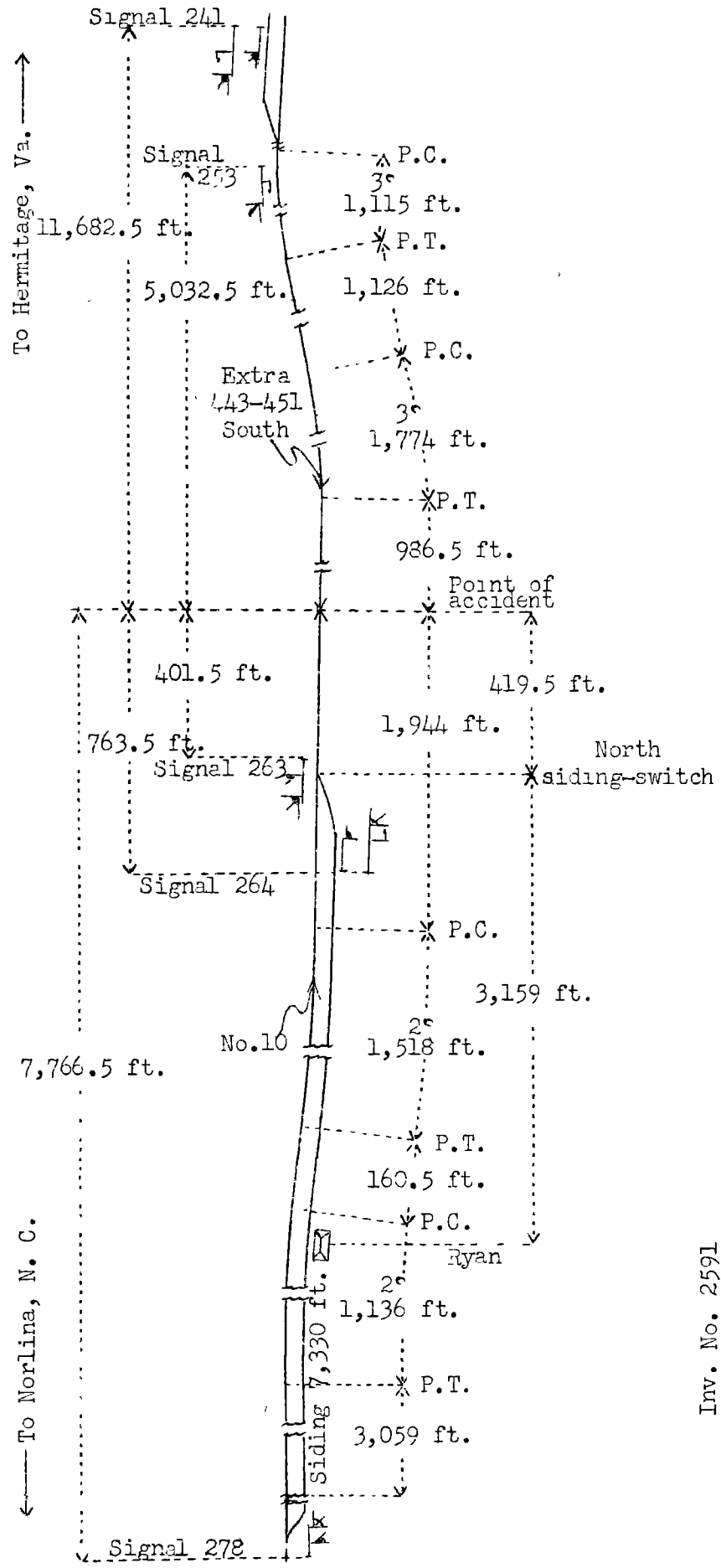
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REPORT OF THE COMMISSION

PATTERSON, Commissioner:

On May 28, 1942, there was a head-end collision between
a passenger train and a freight train on the Seaboard Air
Line Railway near Ryan, Va., which resulted in the injury of
48 passengers, 2 Pullman employees on duty, 4 Pullman em-
ployees off duty, 1 dining-car employee, 1 Diesel attendant,
2 train porters and 10 train-service employees.

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

- o Hermitage, Va. 3.3 mi.
- o Brown Street 0.6 mi.
- o Richmond 18.7 mi.
- o Lynch 4.2 mi.
- o Petersburg 4.6 mi.
- x Ryan (P. of A.) 3.6 mi.
- o Burgess 32.8 mi.
- o Cochran, Va. 34.5 mi.
- o Norlina, N. C. 57.7 mi.
- o Raleigh, N. C.



Inv. No. 2591
 Seaboard Air Line Railway
 Ryan, Va.
 May 28, 1942

Location of Accident and Method of Operation

This accident occurred on that part of the Virginia Division designated as the Richmond Sub-division and extending between North Hermitage, Va., and Norlina, N. C., a distance of 102.5 miles. Between a point 0.2 mile north of Brown Street, Richmond, Va., and a point 0.7 mile north of Cochran, Va., a distance of 62.4 miles, trains are operated by a centralized-traffic-control system and move in either direction by signal indications which supersede time-table superiority and take the place of train orders. In the immediate vicinity of the point of accident this is a single-track line. At Ryan a siding 7,530 feet in length parallels the main track on the east. The north and south switches are power operated. The north switch of this siding is located at a point 3,159 feet north of the station. The accident occurred on the main track at a point 419.5 feet north of the north siding-switch. As the point of accident is approached from the north there are, in succession, a 3° curve to the left 1,115 feet in length, a tangent 1,126 feet, a 3° curve to the right 1,774 feet and a tangent 936.5 feet to the point of accident. As the point of accident is approached from the south there are, in succession, a tangent 3,059 feet in length, a 2° curve to the right 1,136 feet, a tangent 160.5 feet, a 2° curve to the left 1,518 feet and a tangent 1,944 feet to the point of accident. At the point of accident the grade for north-bound trains is 0.58 percent ascending.

Signals 278 and 264, which govern north-bound movements, are located, respectively, 7,766.5 feet and 763.5 feet south of the point of accident. Signals 241, 255 and 263, which govern south-bound movements, are located, respectively, 11,682.5 feet and 5,032.5 feet north and 401.5 feet south of the point of accident. These signals are of the color-light type and are continuously lighted. Signals 263 and 278 are two-unit, semi-automatic signals. The aspects and corresponding indications and names of these signals are as follows:

| <u>Aspect</u> | <u>Indication</u> | <u>Name</u> |
|-----------------|---------------------------------------|--------------------|
| Green-over-red | Proceed | Proceed Signal |
| Yellow-over-red | Approach next signal prepared to stop | Approach Signal |
| Red-over-red | Stop | Stop Signal |
| Red-over-yellow | Take Siding | Take-Siding Signal |

Signals 241 and 264 are one-unit, semi-automatic signals. The aspects and corresponding indications and names of these signals are as follows:

| <u>Aspect</u> | <u>Indication</u> | <u>Name</u> |
|---------------|---------------------------------------|-----------------|
| Green | Proceed | Proceed Signal |
| Yellow | Approach next signal prepared to stop | Approach Signal |
| Red | Stop | Stop Signal |

Signal 253 is a one-unit, automatic signal. The aspects and corresponding indications and names of this signal are as follows:

| <u>Aspect</u> | <u>Indication</u> | <u>Name</u> |
|---------------------------------|---------------------------------------|-------------------------|
| Green | Proceed | Proceed Signal |
| Yellow | Approach next signal prepared to stop | Approach Signal |
| Red-over-lunar-white, staggered | Stop, then Proceed | Stop and Proceed Signal |

Time locking is provided and the circuits of the controlled signals involved are so arranged that when the north siding-switch at Ryan is lined for a south-bound movement to the siding and signal 241 displays proceed, signal 253 will display approach, signal 263 will display take-siding, signal 264 will display stop, and signal 278 will display approach. An interval of 3 minutes 30 seconds must elapse before this route can be changed. When the north siding-switch at Ryan is lined for a north-bound movement on the main track and a proceed indication is displayed by signals 278 and 264, signals 241, 253 and 263 will display stop. An interval of 3 minutes 55 seconds must elapse before this route can be changed. When a south-bound train passes signal 241, signal 264 will display stop and signal 278 will display approach, and the indications of signals 264 and 278 cannot be changed to display less restrictive indications until the south-bound train is clear of the circuit.

The centralized-traffic-control system is in the charge of the train dispatcher at Raleigh, 128.6 miles south of Ryan. The control machine is provided with a track diagram, lamp indications, signal and switch levers and an automatic train-movement recorder. The lamp indications on the track diagram consist of approach and OS lamps. Each approach lamp is provided with a white lens and each OS lamp is provided with a red lens. The approach lamps are illuminated when track sections between adjacent sidings are occupied. An OS lamp is illuminated when a track section in the immediate vicinity of a siding switch is occupied. In addition, an OS lamp is illuminated when a power-operated switch is in hand-throw position and when a power failure occurs. The lamp indications on the control panel consist of signal lamps and switch lamps. When a signal lever is placed in position for stop to be displayed by a semi-automatic signal a light through a red lens is displayed by a signal lamp. When a signal lever is placed in position for proceed or approach to be displayed by a semi-automatic signal a light through a green lens is displayed by a signal lamp. When a switch lever and a power-operated siding-switch are set for movement on the main track a light through a green lens is displayed by a switch lamp. When a switch lever is in reverse position and a power-operated siding-switch is set for movement to a siding a light through an amber lens is displayed by a switch lamp. When a train occupies an OS track section a record is made automatically on the graph of the train-movement recorder. In addition, a record is made on the graph when a power-operated siding-switch is in hand-throw position and when a power failure occurs,

Operating rules read in part as follows:

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, * * *

* * *

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

509. * * *

F. A train passing an Approach Signal must proceed at reduced speed prepared to Stop before passing the next Signal.

* * *

In the vicinity of the point of accident the maximum authorized speed for the passenger train involved is 65 miles per hour and for freight trains, 40 miles per hour.

Description of Accident

No. 10, a north-bound first-class passenger train, consisted of Diesel-electric engines 3003 and 3012, one express car, one passenger-baggage car, two coaches, one dining car, one Pullman lounge car and one Pullman sleeping car, in the order named. The first car was of steel-underframe construction and the remainder were of all-steel construction. An air-brake test was made at Raleigh and the brakes functioned properly en route. This train departed from Norlina, N. C., 70.9 miles south of Ryan, at 7:21 a. m., according to the dispatcher's record of movement of trains, 11 minutes late, passed signal 278 and the south siding-switch at Ryan at 8:54 a. m., according to the train-recorder graph, passed signal 264 and the north siding-switch at 8:55 a. m., and while moving at an estimated speed of 30 to 35 miles per hour it collided with Extra 443-451 South at a point 419.5 feet north of the north siding-switch.

Extra 443-451 South consisted of engines 443 and 451 and a caboose. This train departed from Hermitage, 31.4 miles north of Ryan, at 8:08 a. m., according to the dispatcher's record of movement of trains, passed the south siding-switch at Petersburg at 8:52 a. m., according to the train-recorder graph, passed signal 241, which displayed proceed, passed signal 253, which

displayed approach, and while moving at an estimated speed of 15 to 25 miles per hour it collided with No. 10.

From a north-bound engine signal 278 can be seen a distance of about 3,400 feet and signal 264 can be seen a distance of about 2,000 feet.

The front end of Diesel-electric engine 3008 was badly damaged. The engine-truck frame and the main frame were badly bent. The main frame of Diesel-electric engine 3012 was badly bent and the floor was buckled. The first car was slightly damaged. The side frames and end platforms of the second and third cars were bent or broken and both cars were considerably damaged. The boiler of engine 443 was torn from its frame and stopped on top of the front end of Diesel-electric engine 3008. Both cylinders and the smokebox of engine 443 were demolished. The tender cistern was bent inward. The front end of engine 451 was considerably damaged.

It was clear at the time of the accident, which occurred about 8:55 a. m.

The train-service employees injured were both engineers, both firemen, the conductor and the flagman of Extra 443-451 South, and the engineer, the baggagemaster and the flagman of No. 10 and a conductor deadheading on the engine of No. 10.

Data

During the 30-day period preceding the day of the accident, the average daily movement in the vicinity of the point of accident was 45.8 trains.

According to information furnished by the railroad, the last north-bound train for which an approach indication was displayed by signal 278, was No. 44 on May 16.

According to information furnished by the railroad, an electrical storm occurred in the vicinity of Ryan on May 22. After the accident, evidence of lightning was found on the lightning arresters in the junction box on the line pole near the location of signal 278, and the lamp bulb for the yellow aspect of the upper unit of signal 278 was found shattered. The lamp bulbs of this signal functioned properly when last inspected on May 20.

In tests made after the accident the signals involved functioned properly and no evidence of crossed wires or grounds was disclosed. The centralized-traffic-control machine functioned properly and the signals and the switch involved responded properly when actuated by manipulation of the control levers. The OS lamp for the track section in the immediate vicinity of

the north siding-switch at Ryan was tested and it was illuminated when the track section was occupied, when the north siding-switch was in hand-throw position and when the power was removed. When the OS light was illuminated a record was made on the graph of the train-movement recorder. No other condition was found that would cause the OS light to be illuminated.

Discussion

The rules governing operation in centralized-traffic-control territory on the line involved provide that train movements will be governed by signal indications which supersede time-table superiority and take the place of train orders. Under the rules, an approach indication requires the speed of a train to be reduced and to be so controlled that a train can be stopped short of the next signal. A signal imperfectly displayed must be regarded as the most restrictive indication that can be given by that signal. All the employees involved understood these requirements.

The train dispatcher at Raleigh lined the route for No. 10 to proceed on the main track to the clearance point at the north siding-switch at Ryan. Extra 443-451 South passed Lynch, 8.8 miles north of Ryan, at 8:45 a. m. and soon afterward the dispatcher lined the route for this train to pass Petersburg, 4.6 miles north of Ryan, and to enter the siding at the north siding-switch at Ryan to meet No. 10. Extra 443-451 passed signal 241 and the south siding-switch at Petersburg at 8:52 a. m. No. 10 passed the south siding-switch and signal 278 at Ryan at 8:54 a. m., passed signal 264 and the north siding-switch at 8:55 a. m. and collided with Extra 443-451 at a point 419.5 feet north of the north siding-switch at 8:55:30 a. m.

As No. 10 was approaching signal 278, located 7,766.5 feet south of the point where the accident occurred, the speed was about 65 miles per hour, and the enginemen, a deadhead conductor and the diesel attendant were maintaining a lookout ahead from the control compartment on the engine. There was no condition of the engine that obscured their vision or distracted their attention. According to the statements of these employees, signal 278 displayed proceed and they called the indication. The enginemen and the deadhead conductor kept signal 278 under observation until the engine passed it. When the engine reached a point about 1,600 feet south of signal 264, the speed was about 60 miles per hour, and the engineer observed simultaneously signal 264 displaying a red aspect and Extra 443-451 approaching the north siding-switch. The engineer of No. 10 immediately moved the brake valve to emergency position but he was unable to stop his train short of either signal 264 or the north siding-switch. The speed was about 30 or 35 miles per hour when the engineer jumped off just before the collision occurred.

As Extra 443-451 was approaching the point where the accident occurred, the speed was about 35 miles per hour and the enginemen were maintaining a lookout ahead. All signals north of signal 253 displayed proceed for their train. Signal 253 displayed approach and the engineer of the first engine made a service brake-pipe reduction. When the engines reached a point about 900 feet north of signal 263, the engineer of the first engine observed simultaneously signal 263 changing from a take-siding indication to a stop indication and No. 10 passing the north siding-switch. The engineer of the first engine of Extra 443-451 immediately moved the brake valve to emergency position and the speed was considerably reduced, but the distance was not sufficient for either train to stop before the collision occurred.

The train dispatcher said that after he moved the signal levers to clear the signals at Petersburg and moved the switch lever to line the north siding-switch at Ryan for Extra 443-451, the lamps on the control panel indicated that the signals at Petersburg displayed proceed, but the lamp which should have indicated the position of the north siding-switch remained dark and the red OS lamp for the track section in the vicinity of the north siding-switch became illuminated. The dispatcher was of the opinion that the switch had not locked in reverse position for the movement to the siding and that both trains would be delayed. He instructed the signal maintainer at Petersburg to go to Ryan to investigate. The accident occurred before the signal maintainer arrived at Ryan.

After the accident, inspection of the north siding-switch disclosed that the switch had been run through. The switch machine was locked in reverse position, the switch circuit controller was connected to the switch points and there was no evidence that the switch had not functioned properly prior to the time the engine of No. 10 passed over it. There was no record on the graph of the train-movement recorder to indicate that the OS lamp had been illuminated prior to the time the engine of No. 10 entered the track section in the vicinity of the switch. The lamp bulb for the yellow aspect of the upper unit of signal 278 had been shattered. The lamp bulbs of this signal functioned properly when last inspected, eight days prior to the accident. An electrical storm occurred in the vicinity of Ryan six days prior to the accident. After the accident, there was evidence of lightning on the arresters in the junction box on the line pole near the location of signal 278. Officials of the railroad were of the opinion that the shattered lamp bulb was the result of damage by lightning and that it was shattered prior to the time of the accident.

Extra 443-451 passed signal 241 at 8:52 a. m. and No. 10 passed signal 278 at 8:54 a. m., or 2 minutes after Extra 443-451 entered the involved track circuit, which is so arranged

that when a south-bound train passes signal 241, signal 264 should display stop and signal 278 should display approach. Since the lamp bulb of the yellow aspect in the top unit of signal 278 was shattered, an approach indication could not have been displayed by this signal and, if the involved signals and related appurtenances of the centralized-traffic-control system otherwise functioned properly at the time the route was lined to establish a meeting point between No. 10 and Extra 443-451 South at Ryan, signal 278 should have displayed an imperfect indication which, under the rules, would require No. 10 to be stopped short of that signal. However, the four employees on the engine of No. 10 were positive that signal 278 displayed proceed from the time the aspect became visible until their engine passed it, and the engineer operated the train accordingly until he observed the red aspect of signal 264.

Under the system of operation which was in effect on the line where this accident occurred, meeting points for trains are not determined by timetable authority nor fixed by train order, and no advance information with respect to trains to be met or points at which meets are to be made is furnished to train crews. Certain train-service employees of this carrier stated that greater safety is provided under the method of operation by timetable, train orders and automatic block signal system than under the method of operation by signal indication only. If the meeting point for the trains involved in this accident had been established by train order this accident would have been prevented notwithstanding the fact either that there was a false clear signal indication or that an imperfect signal indication was displayed.

Cause

It is found that this accident was caused by a passenger train overrunning a stop signal after it had accepted a proceed indication at the approach signal which should have displayed an imperfect indication, under a system of train operation by signal indication only.

Dated at Washington, D. C., this twenty-fourth day of August, 1942.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.