

RAILROAD ACCIDENT INVESTIGATION

Report No 3797

THE RICHMOND, FREDERICKSBURG AND POTOMAC RAILROAD COMPANY

ALEXANDRIA, VA

JULY 1, 1958

INTERSTATE COMMERCE COMMISSION

Washington

SUMMARY

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DATE	July 1, 1958	
RAILROAD	Richmond, Fredericksburg and Potomac	
LOCATION	Alexandria, Va	
KIND OF ACCIDENT	Rear-end collision	
TRAINS INVOLVED	Passenger	Passenger
TRAIN NUMBERS	108	204
LOCOMOTIVE NUMBERS	Diesel-electric units 1011, 1051, and 1203	C & O diesel-electric units 4015 and 4026
CONSIST	20 cars	11 cars
SPEEDS	Standing	15-20 m p h
OPERATION	Signal indications	
TRACK	Double, 2° curve, vertical curve	
WEATHER	Clear	
TIME	2 26 p m	
CASUALTIES	25 injured	
CAUSE	Failure to operate following train in accordance with signal indication	

INTERSTATE COMMERCE COMMISSION

REPORT NO 3797

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

THE RICHMOND, FREDERICKSBURG AND POTOMAC RAILROAD COMPANY

July 30, 1958

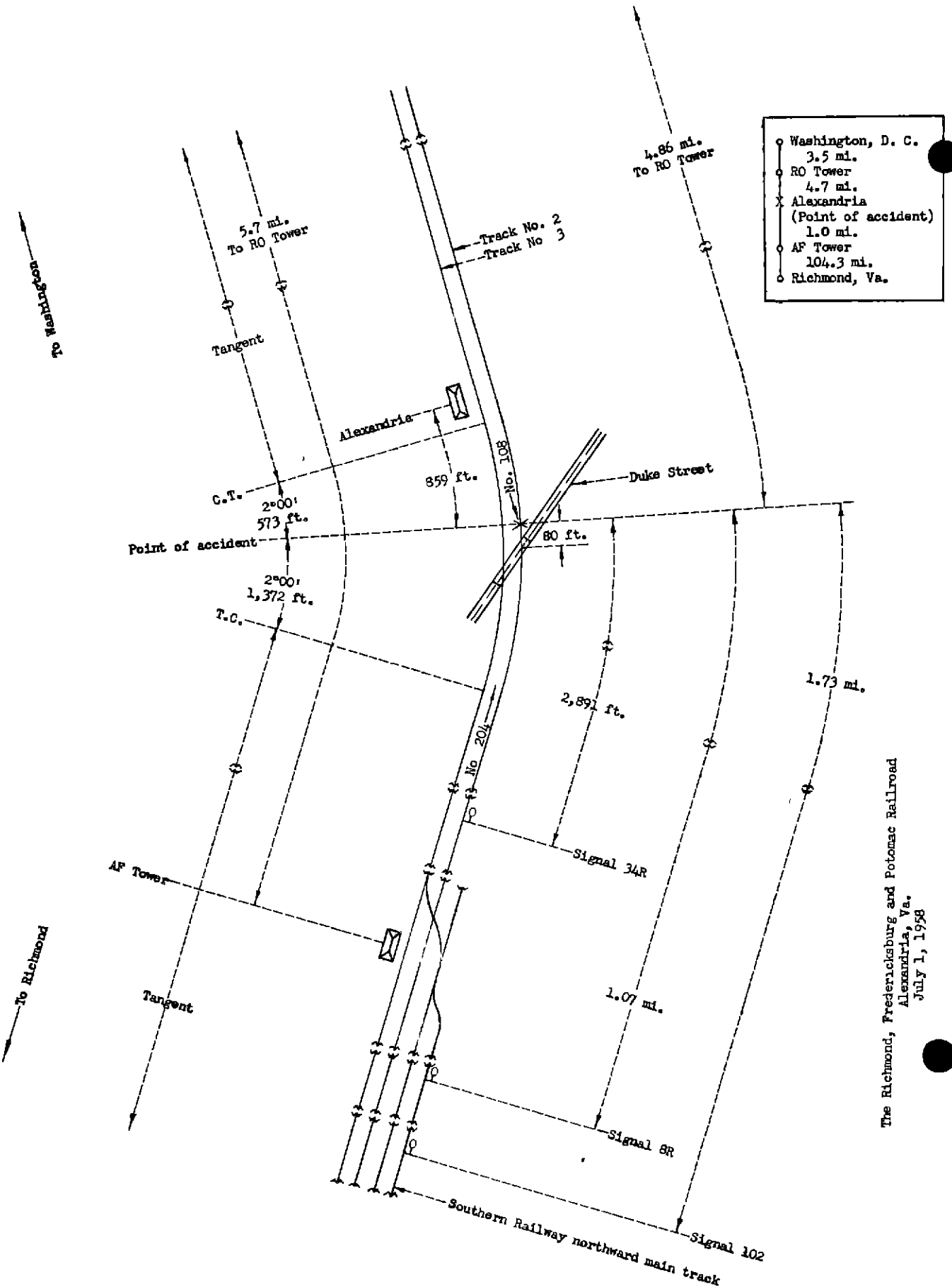
Accident at Alexandria, Va , on July 1, 1958, caused by failure to operate the following train in accordance with a signal indication

REPORT OF THE COMMISSION¹

TUGGLE, Commissioner

On July 1, 1958, there was a rear-end collision between 2 passenger trains on the Richmond, Fredericksburg and Potomac Railroad at Alexandria, Va , which resulted in the injury of 19 passengers and 6 railway mail clerks

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



The Richmond, Fredericksburg and Potomac Railroad
 Alexandria, Va.
 July 1, 1958

Location of Accident and Method of Operation

This railroad extends between Richmond, Va., and RO Tower, Va., 3.5 miles south of Washington, D. C., 110 miles. AF Tower is located 5.7 miles south of RO Tower. Trains of the Chesapeake and Ohio Railway operating between Orange, Va., 81.3 miles south of RO Tower, and RO Tower operate over the Southern Railway between Orange and AF Tower, and over the R F & P between AF Tower and RO Tower. In the vicinity of the point of accident the railroad is a double-track line over which trains are operated in either direction by signal indications supplemented by an intermittent inductive automatic train-stop system for C & O operation and an automatic two-speed train-control system of the continuous inductive type with 4-indication cab signals for R F & P operation. The main tracks from east to west are designated as No. 2 and No. 3. The accident occurred on track No. 2 at a point 4.86 miles south of RO Tower and 859 feet south of the station at Alexandria. From the south on the main tracks there are, in succession, a tangent over a mile in length, and a 2° curve to the left 1,372 feet to the point of accident and 573 feet northward. The grade for northbound trains is, successively, 0.47 percent ascending 1,800 feet, a vertical curve 400 feet, 0.70 percent descending 1,100 feet, a vertical curve 285 feet to the point of accident and 315 feet northward, and level.

Duke Street, Alexandria, spans the railroad on a steel-truss bridge at an angle of approximately 33 degrees. The centerline of the bridge is located 80 feet south of the point of accident.

Automatic signal 102, governing northbound movements on the Southern Railway northward main track, semi-automatic signal 8R, governing movements through AF interlocking from the Southern Railway northward main track, and semi-automatic signal 34R, governing northbound movements on track No. 2, are located, respectively, 1.73 miles, 1.07 miles, and 2,991 feet south of the point of accident. These signals 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
102	Yellow-over-staggered-green	Proceed, approaching next signal prepared to take diverging route	Approach Diverging
8R	Red-over-yellow-over-red	Proceed at medium speed prepared to stop at next signal	Medium Approach
34R	Green-over-red	Proceed	Clear
34R	Red-over-yellow	Proceed at restricted speed	Restricting

Signals 8R and 34R are controlled from AF Tower. The controlling circuits are so arranged that when the block of signal 34R is occupied by a northbound train and the route is then lined for the movement of a northbound train from the Southern Railway northward main track to the block of signal 34R, signal 102 displays an Approach-Diverging aspect, signal 8R displays a Medium-Approach aspect, and signal 34R displays a Restricting aspect.

This carrier's operating rules read in part as follows

DEFINITIONS

SPEEDS

MEDIUM SPEED - Not exceeding twenty-five (25) miles per hour

RESTRICTED SPEED - Not exceeding fifteen (15) miles per hour prepared to stop short of train, obstruction or switch not properly lined, and to look out for broken rail

OPERATING RULES

14 ENGINE WHISTLE SIGNALS

NOTE The signals prescribed are illustrated by "o" for the short sounds, "--" for longer sounds * * *

SOUND	INDICATION
(g) o o	Answer to * * * any signal not otherwise provided for

29 When a signal, except a fixed signal, is given to stop a train, it must, unless otherwise provided, be acknowledged as prescribed by Rule 14 (g) * * *

34 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 engine or train

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 maximum authorized speed for passenger trains in the vicinity of the point of accident is 40 miles per hour

Description of Accident

No 108, a northbound first-class passenger train, consisted of diesel-electric units 1011, 1051, and 1203, coupled in multiple-unit control, 1 baggage car, 4 refrigerator cars, 2 baggage cars, 1 mail car, 2 baggage cars, and 10 coaches, in the order named. The 12th to the 19th cars, inclusive, were of lightweight construction. The other cars were of conventional all-steel construction. The 13th to the 19th cars, inclusive, were equipped with tightlock couplers. This train passed AY Tower, 1.7 miles north of Richmond, at 12:20 p. m., 3 minutes late, passed AF Tower, the last open office, at 2:16 p. m., 8 minutes late, passed signal 34R, which displayed a Clear aspect, and stopped at the station at Alexandria at 2:20 p. m. About 6 minutes later the rear end of the train was struck by No 204.

No 204, a northbound first-class passenger train, consisted of C & O diesel-electric units 4015 and 4026, coupled in multiple-unit control, 7 baggage cars, 1 sleeping car, and 3 coaches, in

the order named. The 8th to the 10th cars, inclusive, were of lightweight construction and were equipped with tightlock couplers. The other cars were of conventional all-steel construction. This train departed from Charlottesville, Va., 106.7 miles south of Alexandria, as C & O No. 4 at 12:26 p. m., 6 minutes late, passed Orange at 1:05 p. m., 5 minutes late, passed signal 102, which displayed an Approach-Diverging aspect, passed signal 8R, which displayed a Medium-Approach aspect, passed AF Tower, the last open office, at 2:24 p. m., on time, and became R F & P No. 204, passed signal 34R, which displayed a Restricting aspect, and while moving at a speed of from 15 miles per hour to 20 miles per hour, it struck the rear end of No. 108.

The front trucks of the 4th to the 6th cars, inclusive, and of the 20th car of No. 108 were derailed. The underframe of the 20th car overrode the underframe of the 19th car and the body of the 19th car was telescoped throughout a distance of approximately 6 feet. The 19th and 20th cars were heavily damaged. The 5th and 6th cars were considerably damaged, and the 11th to the 18th cars, inclusive, were slightly damaged. None of the equipment of No. 204 was derailed. The first diesel-electric unit was slightly damaged.

The weather was clear at the time of the accident, which occurred about 2:26 p. m.

The control equipment of the sanding devices of C & O diesel-electric units 4015 and 4026 is so arranged that sand is applied to the rails automatically when the brakes are applied in emergency.

Discussion

As No. 108 was approaching the station at Alexandria the flagman dropped a lighted 5-minute red fusee to the track structure at a point approximately 2,200 feet south of the station. When the train stopped the flagman alighted immediately with flagman's signals and proceeded southward to the south side of Duke Street Bridge approximately 100 feet south of the rear end of the train. He said that he observed No. 204 approaching when it came into view on the curve at a distance of approximately 850 feet. He gave stop signals with a red flag but he said that the signals were not acknowledged. He said that as the train was approaching he observed that an engineman was apparently manipulating the controls. He was unable to estimate the speed of the train when it passed him and he did not observe whether or not the brakes were applied at that time.

As No. 204 was approaching the point where the accident occurred the enginemen were in the control compartment of the first diesel-electric unit. The fireman, who was promoted to engineer in July 1944, was operating the locomotive. The other members of the crew were in various locations in the cars of the train. The brakes of this train had been tested at Charlottesville and had functioned as intended. Both the engineer and the fireman said that the brakes functioned properly en route until immediately before the accident occurred. They said that they called the indications of signals en route. Signal 102 displayed an Approach-Diverging aspect and the fireman said that he initiated a service brake application to reduce the speed of the train to comply with the signal indication. He said that the application was effective and that he released the brakes almost immediately. Signals 8R and 34R displayed a Medium-Approach aspect and a Restricting aspect, respectively. The fireman said that the speed of the train was 25 miles per hour and 20 miles per hour, respectively, when it passed these signals. He said that after the train passed signal 34R he initiated a service brake-pipe reduction but the brakes were ineffective and that he then increased the reduction. He said that he observed the flagman of No. 108 giving stop signals at a distance of

approximately 300 feet and that he acknowledged the signals. He initiated an emergency brake application but he said that this application was also ineffective. He estimated that the speed of the train was about 8 miles per hour when the collision occurred. The engineer said he thought that the train was moving at such speed that it could be stopped short of the preceding train when the fireman applied the brakes in emergency. The first the other members of the crew became aware of anything being wrong was when the collision occurred.

Both service and emergency application and release tests of the brakes of No. 204 were performed shortly after the accident occurred and it was found that the brakes functioned as intended. Brake-pipe leakage was excessive as a result of a broken conductor's brake valve pipe on the second car. The break in the pipe was new and was apparently caused by the collision. Before the pipe was repaired the train proceeded to Washington. The brakes were used several times en route and both the engineer and the fireman said that they functioned as intended.

Extensive tests of the brake equipment of the locomotive and cars of No. 204 were performed after the train arrived at Washington and no defects were found which would cause the brakes to function other than as intended.

Examination of the tapes of the speed-recording devices removed from the diesel-electric units of No. 204 after the accident occurred disclosed that the recorded speed of No. 204 increased from about 26 miles per hour throughout a distance of 0.4 mile to 30 miles per hour and then decreased to about 20 miles per hour in a distance of slightly less than 0.1 mile to the point of accident. Calibration of the speed-recording device of the first diesel-electric unit disclosed that for a recorded speed of 30 miles per hour the train was moving at a speed of 26 miles per hour. Calibration of the speed-recording device of the second diesel-electric unit disclosed that for a recorded speed of 28 miles per hour the train was moving at a speed of 26 miles per hour. After the accident occurred it was found that the rails were heavily sanded south of the point of accident indicating that the brakes of No. 204 were applied in emergency throughout a distance of over 300 feet. It is apparent that the speed of the train was in excess of the speed permitted by the rules of the carrier when it passed signal 34R and that the emergency brake application was not made until the train was closely approaching No. 108.

Under the rules of the carrier, after No. 204 passed signal 34R it was required to be operated in such manner that it could be stopped short of a preceding train.

An official of the carrier said that in the instant case the flagman of No. 108 was required to go back from the rear of the train only a sufficient distance to protect against a following train moving at restricted speed. All the employees involved in the accident understood that requirement.

Cause

This accident was caused by failure to operate the following train in accordance with a signal indication:

Dated at Washington, D. C., this thirtieth day of July, 1958

By the Commission, Commissioner Tuggle,

(SEAL)

HAROLD D. McCOY,

Secretary