

RAILROAD ACCIDENT INVESTIGATION

Report No 3806

NORFOLK AND WESTERN RAILWAY COMPANY

SARDINIA, OHIO

APRIL 6, 1958

INTERSTATE COMMERCE COMMISSION

Washington

SUMMARY

DATE	April 6, 1958	
RAILROAD	Norfolk and Western	
LOCATION	Sardinia, Ohio	
KIND OF ACCIDENT	Side collision	
TRAINS INVOLVED	Freight	Freight
TRAIN NUMBERS	94	99
LOCOMOTIVE NUMBERS	Diesel-electric units 800 and 813	Diesel-electric units 805, 799, and 817
CONSISTS	52 cars, caboose	80 cars, caboose
SPEEDS	21 m p h	47 m p. h
OPERATION	Signal indications	
TRACK	Single, tangent, 0 12 percent ascending grade westward	
WEATHER	Misting	
TIME	2 05 a m	
CASUALTIES	2 killed, 6 injured	
CAUSE	Failure to operate westbound train in accordance with signal indications	

INTERSTATE COMMERCE COMMISSION

REPORT NO 3806

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

NORFOLK AND WESTERN RAILWAY COMPANY

September 22, 1958

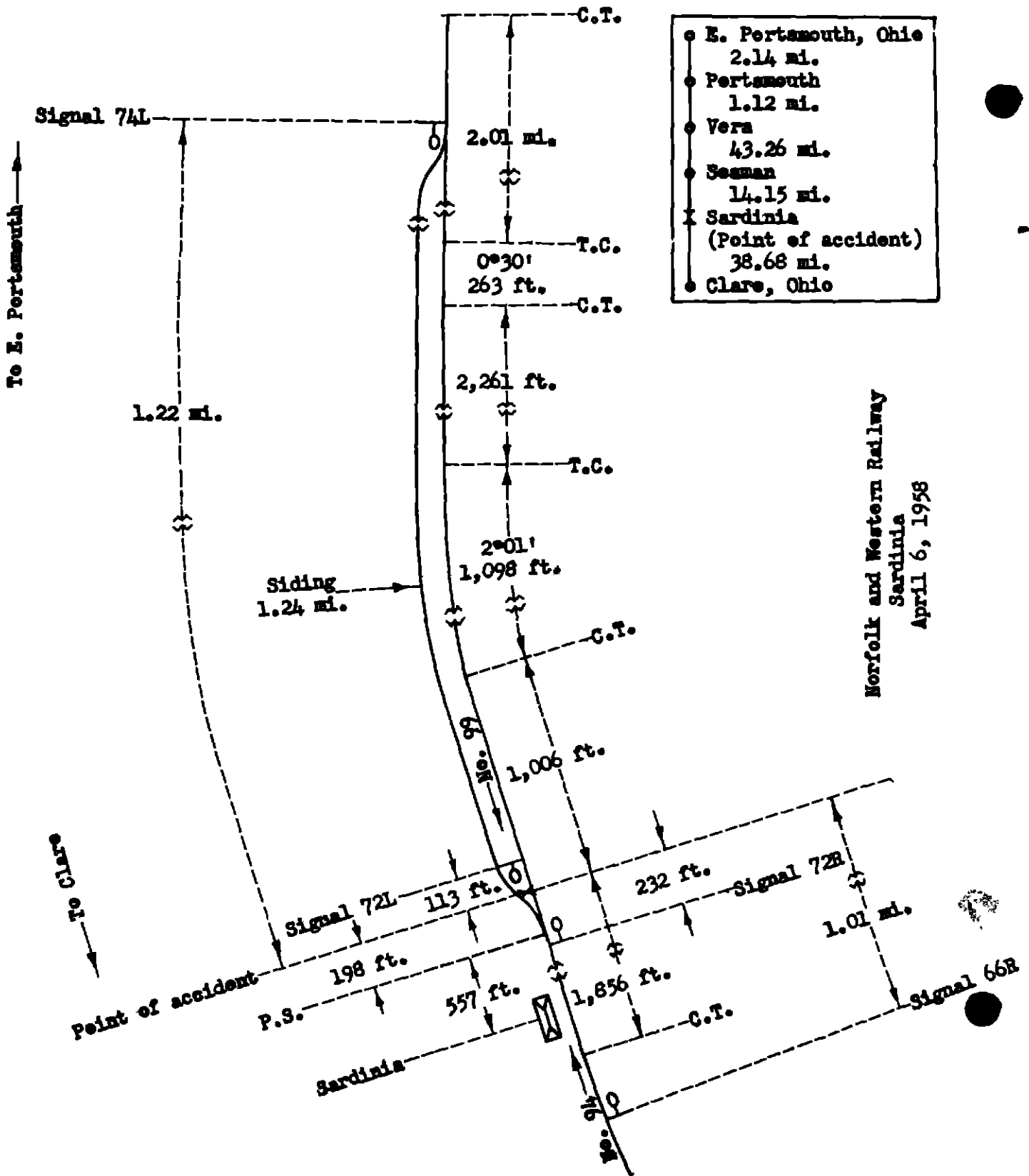
Accident at Sardinia, Ohio, on April 6, 1958, caused by failure to operate a westbound train in accordance with signal indications

REPORT OF THE COMMISSION¹

TUGGLE, Commissioner

On April 6, 1958, there was a side collision between 2 freight trains of the Norfolk and Western Railway at Sardinia, Ohio, which resulted in the death of 2 train-service employees, and the injury of 5 train-service employees and 1 non-trespasser. This accident was investigated in conjunction with representatives of the Public Utilities Commission of Ohio

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



- E. Portsmouth, Ohio
2.14 mi.
- Portsmouth
1.12 mi.
- Vera
43.26 mi.
- Seaman
14.15 mi.
- Sardinia
(Point of accident)
38.68 mi.
- Clare, Ohio

Norfolk and Western Railway
Sardinia
April 6, 1958

To E. Portsmouth →

← To E. Clare

Signal 74L

1.22 mi.

Siding
1.24 mi.

Point of accident

P.S.

Sardinia

No. 94

C.T.

T.C.

T.C.

C.T.

C.T.

Signal 72L

Signal 72B

Signal 66R

232 ft.

1.01 mi.

1,856 ft.

C.T.

557 ft.

198 ft.

113 ft.

No. 99
1,006 ft.

C.T.

2°01'
1,098 ft.

T.C.

2,261 ft.

0°30'
263 ft.

2.01 mi.

- E. Portsmouth, Ohio
2.14 mi.
- Portsmouth
1.12 mi.
- Vera
43.26 mi.
- Seaman
14.15 mi.
- Sardinia
(Point of accident)
38.68 mi.
- Clare, Ohio

Location of Accident and Method of Operation

This accident occurred on that part of the Scioto Division extending between Clare and E Portsmouth, Ohio, 99.35 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by signal indications. At Sardina, 28.68 miles east of Clare, a siding 1.24 miles in length parallels the main track on the north. The west switch of the siding is located 557 feet east of the station. The switch is power-operated and is controlled from Portsmouth, 2.14 miles west of E Portsmouth. The accident occurred within yard limits at a point 198 feet east of the west siding-switch at the fouling point of the siding and the main track. From the west the track is tangent throughout a distance of 1,856 feet to the point of accident and 1,006 feet eastward. From the east there are, in succession, a tangent 2.01 miles in length, a 0°30' curve to the left 263 feet, a tangent, 2,261 feet, a 2°01' curve to the left 1,098 feet, and the tangent on which the accident occurred. The grade for westbound trains is 0.12 percent ascending at the point of accident.

In the vicinity of the point of accident the main track and the siding are laid on a fill approximately 10 feet in height.

Controlled signals 66R and 72R governing eastbound movements are located, respectively, 1.01 miles and 232 feet west of the point of accident. Controlled signals 74L and 72L governing westbound movements are located, respectively, 1.22 miles and 113 feet east of the point of accident. These signals are of the position-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
66R	Three amber lights in diagonal position to the right over three amber lights in vertical position	Proceed preparing to move through turnout beyond next signal at prescribed speed	Approach Medium
72R	Three amber lights in horizontal position over three amber lights in diagonal position to the right	Proceed through turnout at prescribed speed preparing to stop at next signal	Medium Approach
74L	Three amber lights in vertical position	Proceed at prescribed speed	Clear
74L	Three amber lights in diagonal position to the right	Proceed preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed.	Approach
72L	Three amber lights in horizontal position over one amber light	Stop and Stay	Stop and Stay

These signals form part of a traffic-control system which extends between Clare and Vera, 96.06 miles east of Clare. The control machine is located at Portsmouth. Indicator lights on the panel of the control machine indicate track occupancy, whether each controlled signal is displaying a Stop-and-Stay aspect or an aspect other than Stop-and-Stay, and the position of each power-operated switch and whether or not the switch is locked. The controlling circuits are so arranged that a controlled signal will not display an aspect to proceed when any opposing controlled signal or signal governing movements over a conflicting route is displaying other than its most restrictive aspect, when the block between adjacent controlled points is occupied by an opposing train, or when a switch within the route governed by the signal is not in proper position and locked. Time, indication, and route locking are provided. When routes are lined for an eastbound movement to take siding and for a westbound movement to hold the main track, signals 66R and 74L display an Approach-Medium aspect and an Approach aspect, respectively, provided the blocks of these signals are unoccupied, signal 72R displays a Medium-Approach aspect, and signal 72L displays a Stop-and-Stay aspect.

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

DEFINITIONS

Medium Speed -- One-half the maximum authorized speed, but not to exceed 30 miles per hour.

OPERATING RULES

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 train or engine.

261. On portions of the railroad, and on designated tracks so specified in the time-table, trains will be governed by block signals whose indications will supersede the superiority of trains for both opposing and following movements on the same track.

In the vicinity of the point of accident the maximum authorized speed for the freight trains involved was 50 miles per hour. It was restricted to 15 miles per hour for freight trains entering turn-outs.

Description of Accident

No. 94, an eastbound third-class freight train, consisted of road-switcher type diesel-electric units 800 and 813, coupled in multiple-unit control, 52 cars, and a caboose. The control compartment of the first diesel-electric unit was located at the west end. This train departed from Clare, the last open office, at 12:32 a. m., 31 minutes late, passed signal 66R, which displayed an Approach-Medium aspect, passed signal 72R, which displayed a Medium-Approach aspect, and while entering the siding at Sardinia at a speed of 21 miles per hour, as indicated by the tape of the speed-recording device, the locomotive was struck by No. 99 at the fouling point of the siding and the main track.

No. 99, a westbound third-class freight train, consisted of road-switcher type diesel-electric units 805, 799, and 817, coupled in multiple-unit control, 80 cars, and a caboose. The control compartment of the first diesel-electric unit was located at the east end. This train departed from E. Portsmouth at 11:12 p. m., 1 hour 18 minutes ahead of schedule, passed Vera, the last open office, at 11:29 p. m., 1 hour 11 minutes ahead of schedule, passed signal 74L, which should have displayed an Approach aspect, passed signal 72L which displayed a Stop-and-Stay aspect, and while moving at a speed of 47 miles per hour, as indicated by the tape of the speed-recording device, it struck No. 94.

The locomotive of No 94 and the 1st to the 5th cars, inclusive, were derailed. Separations occurred between the diesel-electric units and at both ends of the derailed cars. The 1st diesel-electric unit stopped on its left side at the bottom of the fill with the front end 45 feet north of the point of accident and the rear end 20 feet north of the main track. The 2nd diesel-electric unit stopped on its left side to the rear of the 1st unit. The derailed cars stopped on or near the track structure. The locomotive of No 99, the 1st to the 12th cars, inclusive, and the 54th to the 59th cars, inclusive, were derailed. Separations occurred between the diesel-electric units and at both ends of the derailed cars. The 1st diesel-electric unit stopped on its right side. The front end and rear end of this unit were approximately 220 feet and 260 feet, respectively, west of the point of accident, and 80 feet and 50 feet, respectively, south of the main track. The 2nd diesel-electric unit stopped on its left side, parallel to and approximately 15 feet south of the main track. The east end of this unit was 200 feet west of the point of accident. The 3rd diesel-electric unit stopped upright, parallel to and approximately 10 feet south of the main track. The east end of this unit was 130 feet west of the point of accident. The fuel tank of the 2nd unit of each locomotive was torn open and escaping fuel oil became ignited. Both of these units were heavily damaged by the collision and fire. The other diesel-electric units were heavily damaged by the collision. Fifteen cars were destroyed, 10 cars were heavily damaged, and 3 cars were somewhat damaged. A freight car standing on an auxiliary track north of the siding was destroyed, and another freight car on the auxiliary track was heavily damaged.

The track structure was destroyed in the immediate vicinity of the point of accident and at the location where the 54th to the 59th cars, inclusive, of No 99 were derailed.

Two wood poles supporting the signal and communication lines, and the power transmission line were broken by derailed equipment, and several other poles were damaged. The lines supported by approximately 8 poles were torn down.

The engineer and the fireman of No 94 were killed. The front brakeman of No 94, and the engineer, the fireman, the front brakeman, and the flagman of No 99 were injured. A representative of the locomotive builder, who was in the control compartment of the 3rd diesel-electric unit of the locomotive of No 99, was injured.

It was misting at the time of the accident, which occurred at 2 05 a m.

Discussion

Normally power is supplied to the signal system extending between Clare and Vera by a substation located at Seaman, 14 15 miles east of Sardinia. The circuits are so arranged that in the event of power failure at the substation at Seaman, power to the portion of the signal system extending between Clare and Seaman will automatically be supplied by a substation at Clare, and to the portion of the signal system extending between Vera and Seaman by a substation at Portsmouth. At 12 05 a m on the day of the accident an interruption in the power being supplied by the substation at Seaman occurred and the substations at Clare and Portsmouth automatically began supplying power. Interruptions in the power being supplied by the substation at Portsmouth occurred at 12 10 a m and at 12 39 a m because of lightning. However, the substation at Seaman resumed supplying power and the power being supplied by the substations at Clare and Portsmouth was cut off at 1 25 a m. There were no further power interruptions between that time and the time of the accident.

About 2 00 a m the train dispatcher lined the routes for No 94 to enter the siding at Sardinia at the west siding-switch and for No 99 to proceed on the main track to signal 72L. The indicator lights on the panel of the control machine indicated that signal 72L was displaying a Stop-and-Stay aspect, that signals 66R, 72R, and 74L were displaying aspects less restrictive than Stop-and-Stay, and that the west siding-switch was properly lined and locked.

As No 94 was approaching the point where the accident occurred the fireman and the front brakeman were in the control compartment of the first diesel-electric unit, the engineer, who was not feeling well, was in the control compartment of the second diesel-electric unit, and the conductor and the flagman were in the caboose. The fireman, a qualified engineer, was operating the locomotive. The brakes of this train had been tested and had functioned properly when used en route. Signal 66R displayed an Approach-Medium aspect. The brakeman said that he called the indication and that the fireman answered. The speed of the train was 38 miles per hour when it passed the signal. Signal 72R displayed a Medium-Approach aspect and the speed of the train was reduced to 21 miles per hour when it passed the signal. The front brakeman said that he observed the beam of the headlight of No 99 when the train was approximately 1,400 feet distant. He said at that time he was not aware that No 99 was moving at a high rate of speed. He said that as No 94 was approaching the west siding-switch his view of No 99 was obstructed by the front end of the diesel-electric unit and that he was not aware of anything being wrong until immediately before the collision occurred. He said that the fireman did not initiate a brake application before the collision occurred.

As No 99 was approaching the point where the accident occurred the engineer and the fireman were in the control compartment of the first diesel-electric unit, the front brakeman was in the control compartment of the second diesel-electric unit, and the conductor and the flagman were in the caboose. The brakes of this train had been tested and had functioned properly when used en route. The headlight was lighted brightly. The fireman said he observed that signal 74L displayed a Clear aspect when it was approximately 2,200 feet distant. He called the indication and the engineer answered. Both the engineer and the fireman said that the signal continued to display a Clear aspect as long as it could be observed before the locomotive passed it. The speed of the train was approximately 53 miles per hour when it passed the signal. The fireman said he observed that signal 72L displayed a Stop-and-Stay aspect when it was approximately 2,000 feet distant and that he called a warning to the engineer. The engineer immediately initiated an emergency application of the brakes. The speed of the train was reduced to 47 miles per hour when the collision occurred. Both the conductor and the flagman said that they did not observe the aspect displayed by signal 74L until after the locomotive of the train passed it. The first they became aware of anything being wrong was when the collision occurred.

None of the control equipment of the signals involved in the accident was damaged. Tests of the signal system in the vicinity of the point of accident were begun by forces of the carrier during the afternoon of the day of the accident and were completed after repairs were made to the track structure and the signal lines. It was found that the signal system functioned as intended.

The signal system is so designed that signal 74L cannot display a more favorable aspect than Approach when signal 72L is displaying a Stop-and-Stay aspect. Signal 72L cannot display an aspect other than Stop-and-Stay when the direction of traffic is established for an eastbound movement to signal 72R, when the block is occupied between signals 66R and 72R, or when the west siding-switch is lined for entry to the siding. Based on the speeds of the trains as indicated by the tape

of the speed-recording devices, No 94 passed signal 66R before No 99 passed signal 74L. Therefore, since these three conditions existed immediately prior to the accident it is evident that three separate defects of the signal system would have had to occur in order for signal 72L to display a Clear aspect while No 99 was approaching signal 74L, and that at least one of these defects would then have had to be removed after the locomotive of the train passed signal 74L in order for signal 72L to have displayed a Stop-and-Stay aspect as the train approached that signal. Since tests of the signal system disclosed no condition that would have caused the system to function other than intended, it is evident that all three of these defects would have had to be removed between the time the locomotive of No 99 passed signal 74L and the time the tests were performed, which is an extremely remote possibility. The indicator lights on the control panel at Portsmouth indicated that the route was properly lined for entry of No 94 to the siding and that the signal system was functioning properly immediately before the accident occurred. It is concluded, therefore, that signal 74L displayed an Approach aspect when the locomotive of No 99 passed it.

Cause

This accident was caused by failure to operate the westbound train in accordance with signal indications.

Dated at Washington, D C , this twenty-second day of September, 1958

By the Commission, Commissioner Tuggle

(SEAL)

HAROLD D McCOY,

Secretary

Interstate Commerce Commission
Washington 25, D C
OFFICIAL BUSINESS
RETURN AFTER FIVE DAYS

POSTAGE AND FEES PAID
INTERSTATE COMMERCE COMMISSION

