

RAILROAD ACCIDENT INVESTIGATION

Report No 3771

THE BALTIMORE AND OHIO RAILROAD COMPANY

NORTH VERNON, IND

JULY 20, 1957

INTERSTATE COMMERCE COMMISSION

Washington

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SUMMARY

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DATE	July 20, 1957	
RAILROAD	Baltimore and Ohio	
LOCATION	North Vernon, Ind	
KIND OF ACCIDENT	Rear-end collision	
TRAINS INVOLVED	Freight	Passenger
TRAIN NUMBERS	89	3
LOCOMOTIVE NUMBERS	Diesel-electric units 4406 and 5506	Diesel-electric units 1421 and 2408
CONSISTS	62 cars, caboose	10 cars
SPEEDS	Standing	50 m p h
OPERATION	Timetable, train orders, and automatic block-signal system	
TRACK	Single, 4°08' curve, 1 00 percent descending grade westward	
WEATHER	Clear	
TIME	9 37 a m	
CASUALTIES	1 killed, 24 injured	
CAUSE	Failure to provide adequate protection for preceding train and failure to operate following train in accordance with signal indication	

INTERSTATE COMMERCE COMMISSION

REPORT NO 3771

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

THE BALTIMORE AND OHIO RAILROAD COMPANY

December 19, 1957

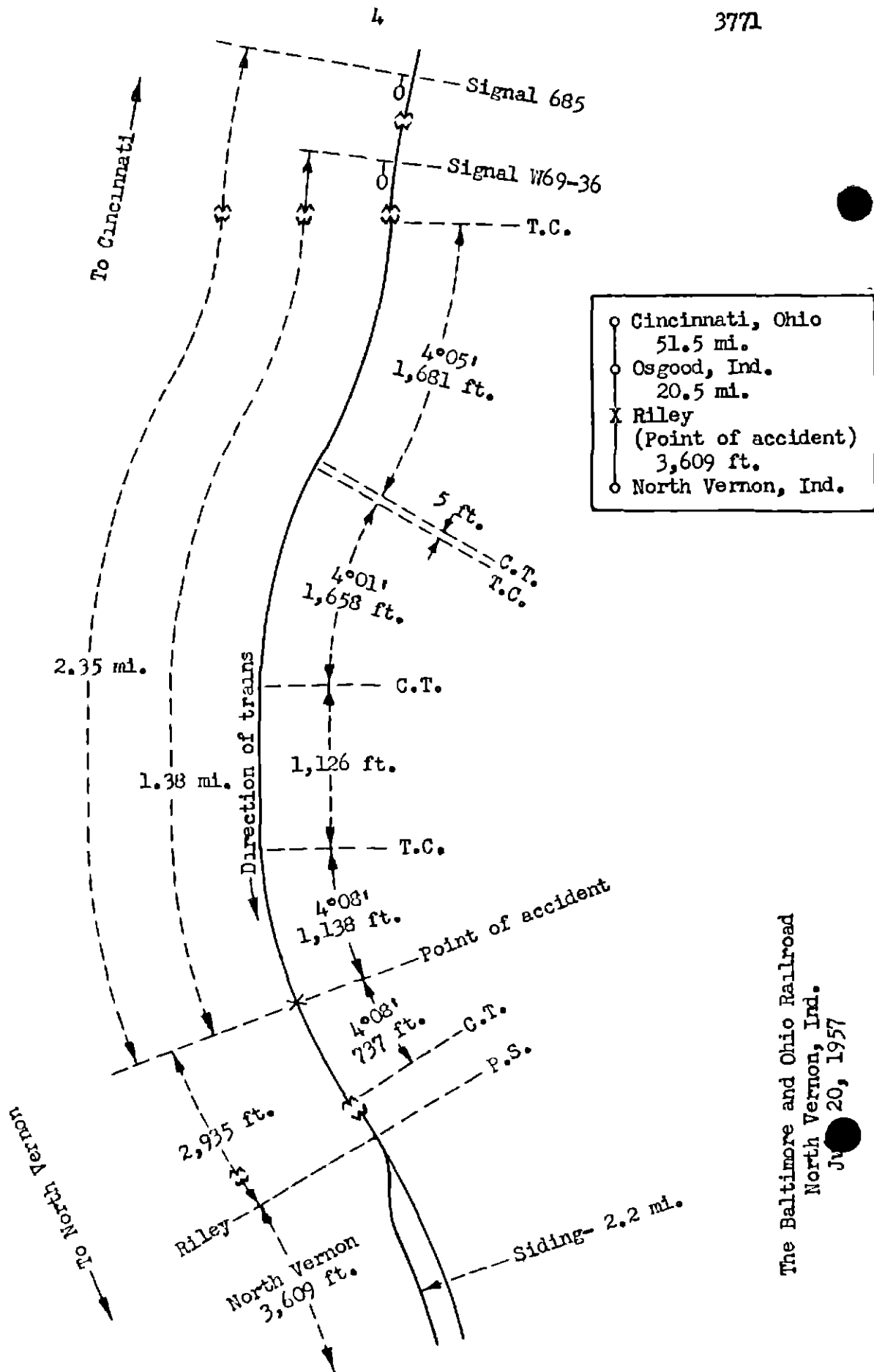
Accident near North Vernon, Ind , on July 20, 1957, caused by failure to provide adequate protection for the preceding train and failure to operate the following train in accordance with a signal indication

REPORT OF THE COMMISSION¹

TUGGLE, Commissioner

On July 20, 1957, there was a rear-end collision between a freight train and a passenger train on the Baltimore and Ohio Railroad near North Vernon, Ind , which resulted in the death of 1 train-service employee, and the injury of 13 passengers, 6 dining-car employees, 1 train porter, 1 employee not on duty, and 3 train-service employees. This accident was investigated in conjunction with a representative of the Indiana Public Service Commission

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



- | | | |
|---|--------------------|---------------------|
| ○ | Cincinnati, Ohio | 51.5 mi. |
| ○ | Osgood, Ind. | 20.5 mi. |
| X | Riley | (Point of accident) |
| | | 3,609 ft. |
| ○ | North Vernon, Ind. | |

The Baltimore and Ohio Railroad
 North Vernon, Ind.
 July 20, 1957

Location of Accident and Method of Operation

This accident occurred on that part of the St. Louis Division extending between Cincinnati, Ohio, and North Vernon, Ind., 72.7 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders, and an automatic block-signal system. At North Vernon, a siding 2.2 miles in length parallels the main track on the north. The east switch of this siding is located at Riley, Ind., 3,609 feet east of the station at North Vernon. The accident occurred on the main track at a point 2,935 feet east of the east siding-switch at Riley. From the east there are, in succession, a 4°05' curve to the right 1,681 feet in length, a tangent 5 feet, a compound curve to the left, having a maximum curvature of 4°01', 1,658 feet, a tangent 1,126 feet, and a 4°08' curve to the left 1,138 feet to the point of accident and 737 feet westward. Throughout a distance of 2,925 feet immediately east of the point of accident the grade varies between 0.65 percent and 1.00 percent descending westward, and it is 1.00 percent descending westward at that point.

Automatic signals 685 and W69-36, governing westbound movements on the main track, are located, respectively, 2.35 miles and 1.38 miles east of the point of accident. These signals are of the color-position-light type and are approach lighted. Aspects applicable to this investigation and the corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
685	Two yellow lights in diagonal position to the right under one white light	Proceed, prepared to stop at next signal. Train exceeding medium speed when indication is seen must take action at once to reduce to medium speed, or slower if necessary.	Approach
W69-36	Two green lights in vertical position under one white light	Proceed	Clear
W69-36	Two red lights in horizontal position under one white light	Stop, then proceed at restricted speed until entire train passes next signal.	Stop and Proceed

The operation of these signals is based on the absolute permissive block principle. The controlling circuits are so arranged that when the block of signal 685 is unoccupied and the block of signal W69-36 is occupied by a westbound movement, signal 685 indicates Proceed-prepared-to-stop-at-next-signal and signal W69-36 indicates Stop-and-proceed.

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

DEFINITIONS

SPEEDS

Medium Speed--A speed not exceeding thirty (30) miles per hour.

Restricted Speed--Proceed, prepared to stop short of train, obstruction, improperly lined switch or broken rail

11 (A) The following signals must be used by flagmen

Day signals--

A red flag,
Torpedoes and fusees

* * *

99 When a train is moving under circumstances in which it may be overtaken by another train, the flagman must take action to insure full protection. By night, or by day when the view is obscured, lighted fusees must be thrown off at proper intervals

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 on the rail, and when necessary, displaying lighted fusee in addition

* * *

The maximum authorized speed for passenger trains in the vicinity of the point of accident is 45 miles per hour

Description of Accident

No 89, a westbound second-class freight train, consisted of diesel-electric units 4406 and 5506, coupled in multiple-unit control, 62 cars, and a caboose. This train departed from Osgood, Ind., 51.5 miles west of Cincinnati, the last open office, at 9:03 a. m., 5 hours 26 minutes late, and stopped at the east siding-switch at Riley about 9:22 a. m. with the rear end of the caboose 2,935 feet east of the switch. About 15 minutes later the rear end was struck by No. 3.

No. 3, a westbound first-class passenger train, consisted of diesel-electric units 1421 and 2408, coupled in multiple-unit control, 1 baggage-mail car, 1 sleeping car, 1 dormitory car, 3 coaches, 1 dining car, and 3 sleeping cars, in the order named. The eighth car was of light-weight construction and the other cars were of conventional all-steel construction. This train departed from Cincinnati on time, passed Osgood, Ind., the last open office, at 9:17 a. m., one minute late, passed signal 685, which indicated Proceed-prepared-to-stop-at-next-signal, passed signal W69-36, which should have indicated Stop-and-proceed, and while moving at a speed of 50 miles per hour, as indicated by the tape of the speed-recording device, it struck the rear of No. 89.

The rear truck of the 58th car of No. 89, the 59th to the 62nd cars, inclusive, and the caboose were derailed and stopped in various positions on or near the track structure. The caboose was destroyed and the four rear cars were badly damaged. The locomotive and the first two cars of No. 3 were derailed. A separation occurred between the first and second diesel-electric units. The first unit stopped with the front end approximately 160 feet west of the point of collision and several feet north of the track, and with the rear end on the track structure. This unit leaned to the north at an angle of about 25 degrees. The second diesel-electric unit and the derailed cars stopped upright on the track structure with the front end of the second unit about 5 feet east of the rear end of the first unit. The first unit was badly damaged, and the second unit and all cars except the sixth and tenth were somewhat damaged.

The engineer of No. 3 was killed. The fireman, the conductor, and the flagman of No. 3, and a brakeman not on duty who was in the caboose of No. 89 were injured.

The sun was shining at the time of the accident, which occurred at 9:37 a. m.

Discussion

As No. 89 was approaching North Vernon the enginemen and the front brakeman were in the control compartment at the front end of the locomotive, the conductor was on top of a car near the middle of the train, and the flagman was in the caboose. The crew had received instructions to set off the first to the 36th cars, inclusive, at North Vernon. There was, however, a misunderstanding between the members of the crew regarding the method to be used in setting these cars off. The engineer expected to move the train to the siding to clear the time of No. 3 before setting the cars off. The conductor said that when cars are required to be set off at North Vernon, it is customary to uncouple the road locomotive and to couple a yard locomotive to the train to move the cut of cars to the siding. He said he expected the movement would be made in that manner on the day of the accident. When the train stopped at the east siding-switch at Riley, the conductor proceeded to the 36th car. He was unable to observe the locomotive of the train because of curvature of the track and vegetation. He said that about 3 minutes after he arrived at the 36th car he heard a locomotive moving and he assumed that a yard locomotive had been coupled to the train in place of the road locomotive. He uncoupled the train at the east end of the 36th car and boarded that car. After the east siding-switch was properly lined, the movement entered the siding. The conductor said that when the 36th car was in the vicinity of the east siding-switch he observed that the movement was being made with the road locomotive. He immediately initiated a brake application from the rear of the 36th car and then gave signals to the front brakeman to reverse the movement. The cut was then moved eastward and coupled to the rear portion of the train. The collision occurred before the train could be moved westward.

The flagman said that when the brakes of the train were applied approaching North Vernon he dropped a lighted fusee to the track structure. He said that when the train stopped at Riley he alighted immediately and proceeded eastward to provide protection. He said that when he reached a point about 450 feet east of the caboose he placed two torpedoes on the rail and then continued eastward. He said that when he heard No. 3 approaching he gave stop signals with a red flag and a lighted fusee but the signals were not acknowledged. It was his opinion that he had reached a point about 1,500 feet east of the caboose when No. 3 passed him and that the train brakes were not applied at that time.

As No. 3 was approaching the point where the accident occurred the enginemen were in the control compartment at the front end of the locomotive, the conductor and the brakeman were in the fourth car, and the flagman was in the rear car. The brakes of this train had been tested and had functioned properly when used en route. The fireman died as a result of injuries received in the accident. He said in a statement shortly after the accident occurred that signal 685 indicated Approach as the train was approaching North Vernon, and that the engineer reduced the speed of the train in compliance with the indication. He said that signal W69-36 indicated Stop-and-proceed and that the engineer reduced speed preparing to stop at that signal. He said that before the train stopped the engineer informed him that the indication of the signal had changed to Proceed and the speed of the train was then increased. The fireman did not observe the indication of the signal at that time. The fireman said that he observed stop signals being given by the flagman of No. 89 when the train was on the curve on which the accident occurred and that he

called a warning to the engineer. He said that the engineer applied the brakes in emergency and that the collision occurred immediately afterward. The conductor said that the brakes were applied as the train approached signal 685 and that the speed of the train was reduced to about 10 miles per hour in the vicinity of signal W69-36. He said that the brakes were then released and that the speed of the train increased until the brakes became applied in emergency immediately before the collision occurred. When the brakes of the train were applied in the vicinity of signal 685, the front brakeman proceeded to the vestibule at the west end of the fifth car and the flagman proceeded to the vestibule at the rear end of the train. Both the front brakeman and the flagman said that they observed signal W69-36 as the train was approaching and that it indicated Stop-and-proceed. However, they said that their view of the signal was obstructed by curvature of the track and vegetation at the time the brakes of the train were released and the speed increased. The flagman said that he did not observe the flagman of No. 89 as the train was approaching the point where the accident occurred. He said that when he proceeded eastward to provide protection after the accident occurred he did not observe the flagman of No. 89.

Examination of the tape removed from the speed-recording device of the locomotive of No. 3 indicated that the speed of the train approaching signal 685 was 70 miles per hour, that a brake application was made at a point approximately 4,300 feet east of the signal, and that the speed of the train was reduced to 30 miles per hour at a point approximately 1,000 feet west of the signal. The speed was then maintained at 30 miles per hour throughout a distance of approximately 1,300 feet. It was then reduced to about 10 miles per hour at a point approximately 600 feet east of signal W69-36. In the immediate vicinity of signal W69-36 the speed of the train increased and continued to increase until it reached 50 miles per hour when the collision occurred.

Shortly after the accident occurred a signal supervisor and a signal maintainer observed that signals 685 and W69-36 indicated Proceed-prepared-to-stop-at-next-signal and Stop-and-proceed, respectively, which were the proper indications for the condition of track occupancy existing at that time. After repairs had been made to the track which was damaged in the accident, tests of the signal apparatus involved disclosed that it functioned as intended.

Observations were made from the control compartment at the front of a diesel-electric locomotive 12 days after the accident and 2 hours later than the time of No. 3 on the day of the accident. Approaching from the east, signal W69-36 first became visible at a point 2,020 feet east of the signal and the aspect of the signal was then clearly visible throughout a distance of about 1,000 feet. An assistant signal engineer said that the signal was focused to give its clearest aspects within that distance. Beginning at a point about 1,000 feet east of the signal, the signal was obscured by vegetation throughout a distance of about 425 feet except for a momentary view at one point. The aspect of the signal was then clearly visible throughout a distance of 157 feet. Between points located 434 feet and 46 feet east of the signal, the signal was visible but the aspect could not be seen distinctly. At a point 205 feet east of the signal the sun was shining directly on the lenses of the signal, and, as a result, the color of all lenses appeared equally bright. The aspect of the signal was clearly visible beginning at a point 46 feet east of the signal and remained so until the train passed the signal.

It is evident from the tests and observations that signal W69-36 indicated Stop-and-proceed when No. 3 passed it, and that the aspect was clearly visible when the train was in the immediate vicinity of the signal. It is apparent from the manner in which the train was operated that the engineer thought the signal indicated Proceed instead of Stop-and-proceed.

The collision occurred about 15 minutes after No 89 stopped at Riley. During that time the flagman of No 89 reached a point about 1,500 feet east of the caboose according to his statement. However, according to the statements of the fireman and flagman of No 3, the flagman of No 89 was considerably nearer the caboose than 1,500 feet when the collision occurred. It is evident that the flagman did not proceed a sufficient distance eastward in the time available to provide adequate protection against a following train moving at a speed of approximately 50 miles per hour.

Cause

This accident was caused by failure to provide adequate protection for the preceding train and failure to operate the following train in accordance with a signal indication.

Dated at Washington, D C , this nineteenth
day of December, 1957

By the Commission, Commissioner Tuggle

(SEAL)

HAROLD D McCOY,
Secretary