

INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2629

THE BALTIMORE & OHIO RAILROAD COMPANY

REPORT IN RE ACCIDENT

NEAR DICKERSON, MD., ON

SEPTEMBER 24, 1942

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SUMMARY

Railroad: Baltimore & Ohio
 Date: September 24, 1942
 Location: Dickerson, Md.
 Kind of accident: Rear-end collision and side collision
 with train moving on parallel track
 Trains involved: Passenger : Passenger : Freight
 Train numbers: 18 : 20 : Extra 4632
 West
 Engine numbers: 5046 : Diesel-electric : 4632
 60
 Consist: 10 cars : 13 cars : 43 cars,
 caboose
 Speed: About 3 m. p. h.: 45 m. p. h. : 35-40
 m. p. h.
 Operation: Timetable, train orders and
 automatic block-signal system
 Track: Double; tangent; 1.05 percent
 ascending grade eastward
 Weather: Foggy
 Time: 7:35:30 a. m.
 Casualties: 12 killed, 2 missing, 76 injured
 Cause: Accident caused by failure to provide ade-
 quate flag protection for preceding train
 and by failure to operate following train
 in accordance with signal indications

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2628

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

THE BALTIMORE & OHIO RAILROAD COMPANY

November 4, 1942.

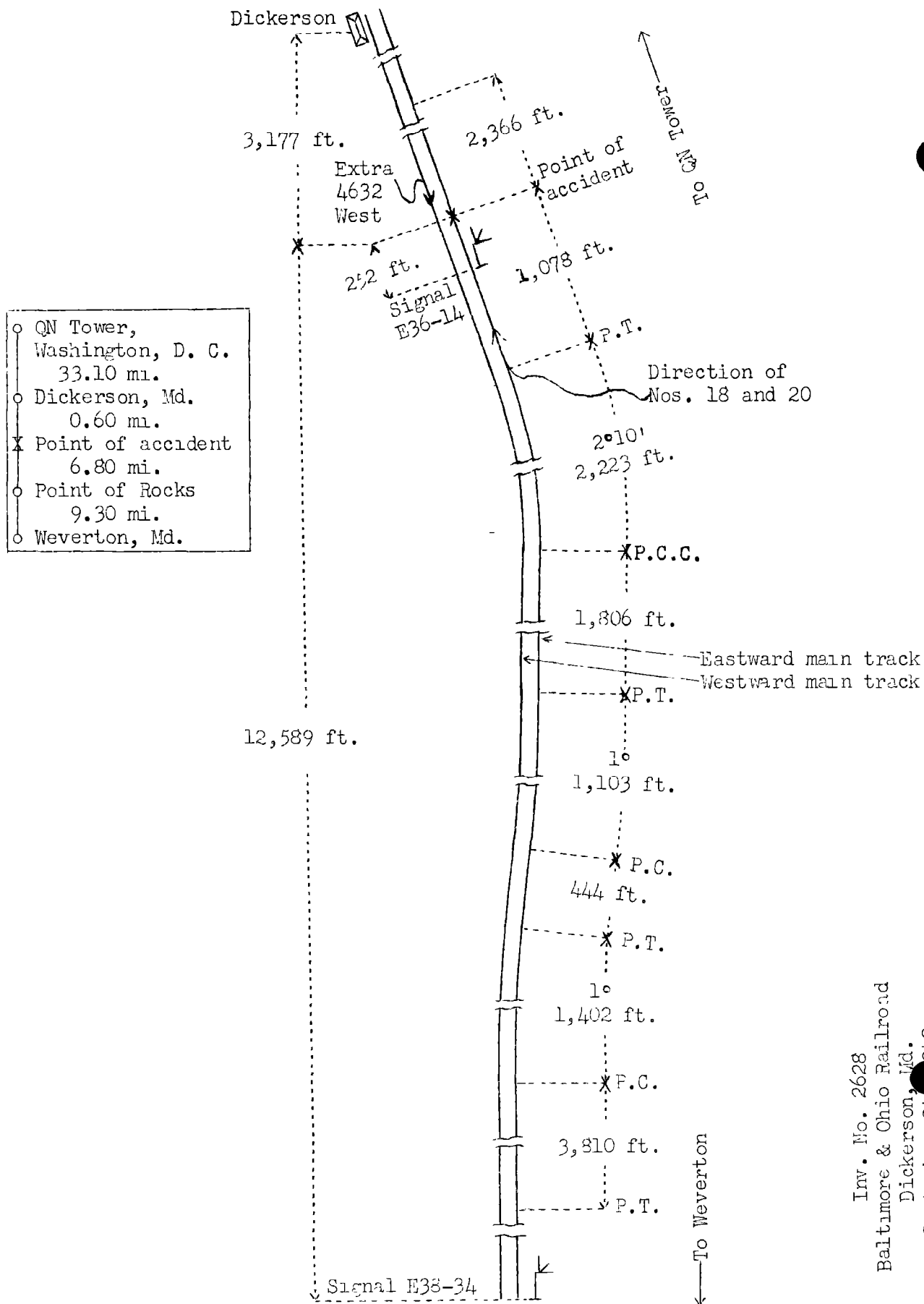
Accident near Dickerson, Md., on September 24, 1942, caused by failure to provide adequate flag protection for preceding train and by failure to operate following train in accordance with signal indications.

REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On September 24, 1942, there was a rear-end collision between two passenger trains and derailed cars collided with a freight train on a parallel track on the Baltimore & Ohio Railroad near Dickerson, Md. This accident resulted in the death of 10 passengers, 1 Pullman employee, and 1 train-service employee, 2 additional persons being missing, and the injury of 61 passengers, 3 Pullman employees, 11 dining-car employees, and 1 train-service employee.

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



Location of Accident and Method of Operation

This accident occurred on that part of the Baltimore Division designated as the Metropolitan Sub-Division and extending between Weverton, Md., and QN Tower, Washington, D. C., a distance of 50.6 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred on the eastward main track 3,177 feet west of the station at Dickerson. As the point of accident is approached from the west there are, in succession, a tangent 3,810 feet in length, a 1° curve to the right 1,402 feet, a tangent 444 feet, a 1° curve to the left 1,103 feet, a tangent 1,806 feet, a compound curve to the left 2,223 feet, the maximum curvature of which is 2°10', and a tangent 1,078 feet to the point of accident and 2,366 feet beyond. As the point of accident is approached from the east the track is tangent a distance of 2,366 feet to the point of accident and 1,078 feet beyond. The grade for east-bound trains varies between 0.35 and 1.05 percent ascending for 1.7 miles immediately west of the point of accident, and is 1.05 percent at that point. The grade for west-bound trains is 1.05 percent descending for 3,043 feet immediately east of the point of accident.

Automatic signals E38-34 and E36-14, which govern east-bound movements on the eastward main track, are located, respectively, 12,589 and 252 feet west of the point of accident. These signals are of the three-indication, one-arm, upper-quadrant, semaphore type, and are approach-lighted. The involved aspects and corresponding indications and names of these signals are as follows:

<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
45 Degrees, yellow	Proceed preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed	Approach
Horizontal, red	Stop then proceed at restricted speed	Stop and Proceed

Operating rules read in part as follows:

SPEED RESTRICTIONS.

NORMAL SPEED--The maximum speed permitted by timetables for main track movements.

MEDIUM SPEED--One-half the normal speed, not to exceed thirty (30) miles per hour.

* * *

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

11. A train finding a fusee burning on or near its track must stop and extinguish the fusee and then proceed at restricted speed.

15. The explosion of two torpedoes is a signal to reduce speed. The explosion of one torpedo will indicate the same as two, but the use of two is required.

* * *

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

35. The following signals must be used by flagmen:

* * *

NIGHT SIGNALS--

A red light,
A white light,
Torpedoes and fusees.

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 fusees.

When signal has been given recalling the flagman * * * and safety to the train will permit, he may return. When the conditions require he must leave the torpedoes and a lighted fusee; * * *

* * *

When a train is moving under circumstances in which it may be overtaken by another train, the flagman must take such action as may be necessary to insure full protection. * * *

When day signals cannot be plainly seen, owing to weather or other conditions, night signals must also be used.

* * *

99. (A). Should a train be seen or heard approaching before the flagman has reached the required distance, he must, at once, place two torpedoes on the rail, and, at night or during foggy or stormy weather, carry a lighted fusee, continuing in the direction of the approaching train.

949A. The duties of the fireman-helper on Diesel locomotives will consist of * * *, observe everything in general in engine-rooms, * * *.

* * * Also observe signals at such points as instructed by the Road Foreman. Signal and train observance can be made from the window in the engine room. * * *

In the vicinity of the point of accident the maximum authorized speed for passenger trains is 70 miles per hour.

Description of Accident

No. 18, an east-bound passenger train, consisted of engine 5046, one baggage car, one baggage-mail car, one passenger-baggage car, two coaches, two Pullman sleeping cars, one dining car, and two Pullman sleeping cars, in the order named. All cars were of steel construction. At Cumberland, 110.5 miles west of Dickerson, a terminal air-brake test was made. This train departed from Weverton, 17.5 miles west of Dickerson, at 7:06 a. m., according to the dispatcher's record of movement of trains, 2 minutes ahead of time, passed Point of Rocks, 7.4 miles west of Dickerson and the last open office, at 7:18 a. m., 2 minutes ahead of time, and, because of failure of the air compressor, stopped about 7:25 a. m. with the rear end standing 222 feet east of signal E36-14. About 6-1/2 minutes later the air compressor was started and the flagman was recalled. About 2-1/2 minutes later, the flagman gave a signal to proceed, and the train had moved about 30 feet eastward when the rear end was struck by No. 20.

No. 20, an east-bound first-class passenger train, consisted of Diesel-electric engine 60, of the two-unit type, one baggage car, one Pullman sleeping car, one passenger-baggage car, three coaches, one dining car, and six Pullman sleeping cars, in the order named. All cars were of steel construction. At Cumberland a terminal air-brake test was made. The brakes were used to control the speed of the train at various points en route and they functioned properly. This train departed from Weverton at 7:15 a. m., according to the dispatcher's record of movement of trains, 1 minute ahead of time, passed Point of Rocks at 7:28 a. m., on time, passed signal E38-34, which displayed approach, passed signal E36-14, which displayed stop-and-proceed, and, while moving at a speed of 45 miles per hour, as indicated by the tape of the speed-recorder with which engine 60 was equipped, it collided with the rear end of No. 18 at 7:35:30 a. m.

Extra 4632 West, a west-bound freight train, consisted of engine 4632, 43 loaded cars and a caboose. At Philadelphia, Pa., 165.8 miles east of Dickerson, a terminal air-brake test was made and the brakes functioned properly at all points where used en route. This train departed from QN Tower, 33.1 miles east of Dickerson and the last open office, at 6:23 a. m. While moving at a speed estimated as being between 35 and 40 miles per hour the fourteenth, fifteenth and sixteenth cars of this train were

scraped by the rear two cars of No. 18, and the seventeenth to the thirty-sixth cars, inclusive, became derailed as a result of the rear two cars of No. 18 fouling the westward main track. The front portion of the train stopped with the rear end of the sixteenth car standing 5,390 feet west of the point of accident.

Between points 3,257 and 557 feet west of the point of accident the track is laid in a cut, the banks of which rise to a maximum height of 18 feet. At the point of accident the track is also laid in a cut, the south wall of which rises to a height of 21 feet. Because of the cuts and track curvature, the view from an east-bound engine of the point where the accident occurred is restricted to 1,460 feet.

As a result of the rear-end collision, No. 18 was pushed eastward about 30 feet and the rear two cars were derailed and buckled to the left. The car next to the rear car scraped cars in Extra 4632 West, and stopped upright and in line with the eastward main track with its rear end standing 240 feet east of the point of accident. Both couplers were bent and the draft gears were damaged. Seven roof sheets, five of the left rear side sheets, the side posts, the left rear corner posts, one side sill and one side-sill angle were bent and broken. The rear car scraped several cars in the train of Extra 4632 and then collided with a considerable number of the cars between the seventeenth and thirty-sixth. The rear car of No. 18 stopped on the eastward main track and in line with it, leaned to the north at an angle of 45 degrees and was demolished. The rear end of this car was 25 feet east of the point of accident. The front truck was under the car immediately ahead. The remainder of the cars of No. 18 were slightly damaged. Both units of Diesel-electric engine 60 of No. 20 were derailed to the right and stopped against the right bank of the cut with the front end standing 215 feet beyond the point of collision. Unit A leaned to the right at an angle of 35 degrees and unit B leaned to the right at an angle of 45 degrees. The front end and the left side of unit A were demolished, both draft gears and the center sills were broken, and the body was out of square. The body of unit B was knocked out of square, the left side was demolished, and the right side was twisted and badly bulged. The left side of the fuel-oil tank was punctured and the escaping oil became ignited. Flames, fumes and heat from the burning oil damaged the rear car of No. 18, which was adjacent to unit B, and all the deaths occurred in this car. The Diesel engines, traction motors, and various appurtenances in both units were badly damaged. The first car of No. 20 was derailed to the right and stopped on its right side, on the roadbed, practically parallel to the tracks and at the rear of unit B. This car was destroyed. The second car was badly damaged by the derailed cars of Extra 4632 West and by fire. The third and fourth cars were slightly damaged. The fourteenth, fifteenth and sixteenth cars of Extra 4632 West were scraped on the left side. The seventeenth to thirty-sixth cars, inclusive, were derailed and stopped, badly damaged, at various angles to the tracks and across them. Of these cars, six were destroyed by fire and five by impact. Between points 100 and 240 feet east of the point of accident, both tracks were blocked

by a tangled mass of iron pipe with which several of the cars of Extra 4632 West were loaded.

It was foggy at the time of the accident, which occurred at 7:35:30 a. m.

The train-service employee killed was the flagman of No. 13, and the train-service employee injured was the conductor of Extra 4632 West.

Data

Diesel-electric engine 60 is provided with HSC brake equipment and a safety-control feature.

The speed-recorder tape of Diesel-electric engine 60 disclosed that the speed of No. 20 was 36 miles per hour at the approach signal, 64 miles per hour 1.4 miles farther east, 55 miles per hour 1,189 feet west of the point of accident, 48 miles per hour at the stop-and-proceed signal, and 45 miles per hour at the point of collision.

Discussion

The rules governing operation on the line involved provide that 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. When recalled, he may return if it is safe to do so. He must place torpedoes and leave a lighted fusee if conditions require. Under the rules governing operation in automatic block-signal territory, an approach indication requires that the speed of a train must be reduced immediately to medium speed and the train must be prepared to stop at the next signal. In addition, all members of train and engine crews must, when practicable, communicate to each other by its name the indication of each signal affecting the movement of their train. The explosion of a torpedo is a signal to reduce speed, and a train finding a fusee burning on or near its track must stop and extinguish the fusee and then proceed at restricted speed.

When No. 18 was approaching the point where the accident occurred the air compressor failed as a result of lack of lubrication, the air pressures decreased and the brakes became applied. Throughout a distance of about 2,200 feet the speed was gradually reduced, and the train stopped at 7:26 a. m. with its rear end standing 222 feet east of signal E33-14. After an interval of 9 minutes No. 18 started again and had moved about 30 feet when the rear end was struck by No. 20.

As No. 20 was approaching signal E33-34 the controller was open, the engineer was maintaining a lookout ahead through the front window and the speed was about 66 miles per hour, according to the tape of the speed recorder with which the engine was equipped. Dense fog restricted visibility considerably. The engineer made various somewhat conflicting statements but finally said that he failed to see signal E33-34 until the control compartment of the engine was opposite the signal mast and then he

observed from the side window the back of the semaphore arm, which was displaying approach at that instant. Because this type of signal drops rapidly as a train passes it, he assumed it had displayed clear for his train and was in the process of dropping to horizontal position. He operated his train in accordance with a clear indication until torpedoes were exploded and he observed a red fusee burning, which was at a point 937 feet west of signal E36-14. After the engine passed the fusee he made a service brake-pipe reduction and attempted to observe the indication displayed by signal E36-14. Because of dense fog and of smoke from the engine of Extra 4632 West, which was moving on the westward main track, he was unable to observe the signal until his engine was a short distance west of it where he observed that the signal displayed stop-and-proceed, and he then placed the brake valve in emergency position. Simultaneously he observed the rear of No. 18, but the distance was not sufficient for stopping his train short of No. 18. The speed was about 45 miles per hour at the time of the accident. The fireman-helper and the Diesel maintainer, who were in the engine compartment of the second unit, first became aware of the impending accident after the brakes were applied in emergency. No other member of the crew of No. 20 was aware of anything being wrong until the collision occurred. The brakes of this train had been tested and had functioned properly en route. In tests made soon after the accident, signals E33-34 and E33-14 functioned as intended. There was no condition of engine 30 that distracted the engineer's attention or obscured his vision. The engineer of No. 20 was regularly assigned to this run on alternate days.

All members of the crew of No. 20 understood that an approach indication requires the speed of a train to be reduced immediately to not exceeding 30 miles per hour and the train to be operated so that it can be stopped short of the next signal. Operating officials said that in automatic block-signal territory only the employees on the engine are required to observe signal indications. Because of duties in the engine compartments of Diesel-electric engines, firemen are not required to observe signal indications except at points where they have been instructed to observe signals; however, the investigation disclosed that firemen in Diesel-electric service had not been instructed concerning which signals should be observed. Since train-service employees and firemen are not required to observe all signal indications, the engineer on a train hauled by a Diesel-electric engine is the only employee required to observe signal indications. In this instance, the engineer failed to operate his train in accordance with an approach indication. If No. 20 had been operated in accordance with the approach indication displayed by signal E38-34, this accident would have been averted.

According to speed-recorder tapes for 100 east-bound passenger trains operated between Point of Rocks and Washington during the 10-day period preceding the day of the accident, 35 trains exceeded the maximum authorized speed of 30 miles per hour through the interlocking at Point of Rocks from 2 to 20 miles per hour, 55 trains exceeded the maximum authorized speed of 70 miles per hour between Point of Rocks and QN Tower from

4 to 12 miles per hour, and all trains exceeded the maximum authorized speed of 15 miles per hour between QN Tower and Washington Terminal Station from 10 to 13 miles per hour. In the territory involved in this accident, on 9 of the 10 days immediately preceding the day of the accident No. 20 received approach indications, which required the speed to be reduced to not exceeding 30 miles per hour, but in no case was the speed reduced below 30 miles per hour and it ranged as high as 60 miles per hour. From this it appears that on the day of the accident No. 20 was being operated in about the same manner as on preceding days. The speed-recorder tapes are available to operating officials for analysis after each trip is completed.

Flag protection was required for No. 18 when the speed was reduced and during the time it was stopped. After the accident the remains of a freshly burned fusee and the cover of a torpedo were found at a point 1,159 feet west of the point where the rear end of No. 18 stood. Torpedo burns were found 1,791.5 and 1,772.5 feet west of the point where the rear end of No. 18 stopped; however, it could not be determined when these torpedoes were exploded. From the time No. 18 was stopped until the collision occurred not less than 9 minutes was available in which to provide flag protection. After the accident, a test disclosed that a person walking at an average gait could proceed westward a distance of 2,572 feet during a period of 8-1/2 minutes, and a person walking briskly could proceed a distance of 2,986 feet during a period of 8-1/2 minutes. The engineer and the conductor of No. 18 said that an interval of 6-1/2 minutes elapsed before the flagman was recalled and about 2-1/2 minutes elapsed from the time he was recalled to the time No. 18 started to move. They said that fog restricted visibility to about 500 feet. No surviving member of the crew of No. 18 either heard or saw No. 20 approaching. No. 18 had moved a distance of about 30 feet when the collision occurred. The conductor of No. 18 said that under the existing weather conditions the flagman should have continued to proceed toward the rear during the time at his disposal, and he should not have returned when he was recalled. However, the conductor delayed the starting of the train until he received a proceed lantern signal from the flagman after the latter had returned to the front end of the rear car. If the flagman had not been recalled when No. 18 was ready to proceed, this train could have departed not less than 2-1/2 minutes before the arrival of No. 20, and the accident would have been averted. Since the flagman was killed in the accident, it could not be determined why he failed to proceed westward far enough to provide adequate protection.

The investigation disclosed a lack of common understanding not only among employees but also among operating officials as to what constitutes proper flag protection. Some of the officials and employees thought the flag protection provided for No. 18 in this case was sufficient, but others thought it was not adequate. The conditions disclosed by this investigation are similar to conditions and practices disclosed by previous investigations on this railroad. During a period of 21 months immediately prior to this accident, the Commission investigated,

among others, eight accidents which occurred on the Baltimore & Ohio Railroad as a result of failure to comply with provisions of the operating rules. Three of these investigations involved inadequate flag protection, five involved failure to obey signal indications, five involved lax enforcement of the rules, and two were cases where the engineer on a Diesel-electric engine was the only employee in position to observe signal indications. These factors were involved in the accident at Dickerson. In the present investigation, there was no evidence that operating officials had taken measures to correct conditions pointed out in these eight reports. From the manner in which Nos. 18 and 20 were operated in this instance, it is apparent that corrective measures by operating officials have not been effective; therefore, 30 days after this report is released the Baltimore & Ohio Railroad Company will be expected to report to the Commission as to measures which it has taken to correct the improper practices disclosed by this investigation and to prevent the recurrence of accidents of this character.

The casualties and destruction in this accident were the result largely of fire to which fuel oil from the Diesel-electric engine contributed materially.

Diesel-electric engine 60 of No. 20 was equipped with an automatic train-stop device, but this section of the line was not equipped with the track appliances for operating it. If the automatic train-stop system had been in operation on this portion of the line this accident undoubtedly would have been prevented.

Cause

It is found that this accident was caused by failure to provide adequate flag protection for the preceding train and by failure to operate the following train in accordance with signal indications.

Dated at Washington, D. C., this fourth day
of November, 1942.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. PARTEL,
Secretary.