INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2671

THE BALTIMORE & OHIO RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT NEWBURG, W. VA., ON

FEBRUARY 8, 1943

SUMMARY

Railroad:	Baltimore & Ohio	
Date:	February 8, 1943	
Location:	Newburg, W. Va.	
Kind of accident:	Rear-end collision	
Trains involved:	Light engines	: Freight
Train numbers:	Extra 7101 West	: Extra 7132 West
Engine numbers:	7101-7211	: 7132
Consist:		: 69 cars, caboose
Speed:	Standing	: 20 m. p. h.
Operation:	Automatic block-signal system	
Track:	Three tracks; 2°45' curve to right; 0.79 percent descending grade westward	
Weather:	Clear	
Time:	5:38 p. m.	
Casualties:	1 killed; 2 injured	
Cause:	Accident caused by failure to provide adequate flag protection for preceding train, and by failure to operate following train in accordance with signal indication	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2671

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

THE BALTIMORE & OHIO RAILROAD COMPANY

March 2, 1943.

Accident at Newburg, W. Va., on February 8, 1943, caused by failure to provide adequate flag protection for preceding train, and by failure to operate following train in accordance with signal indication.

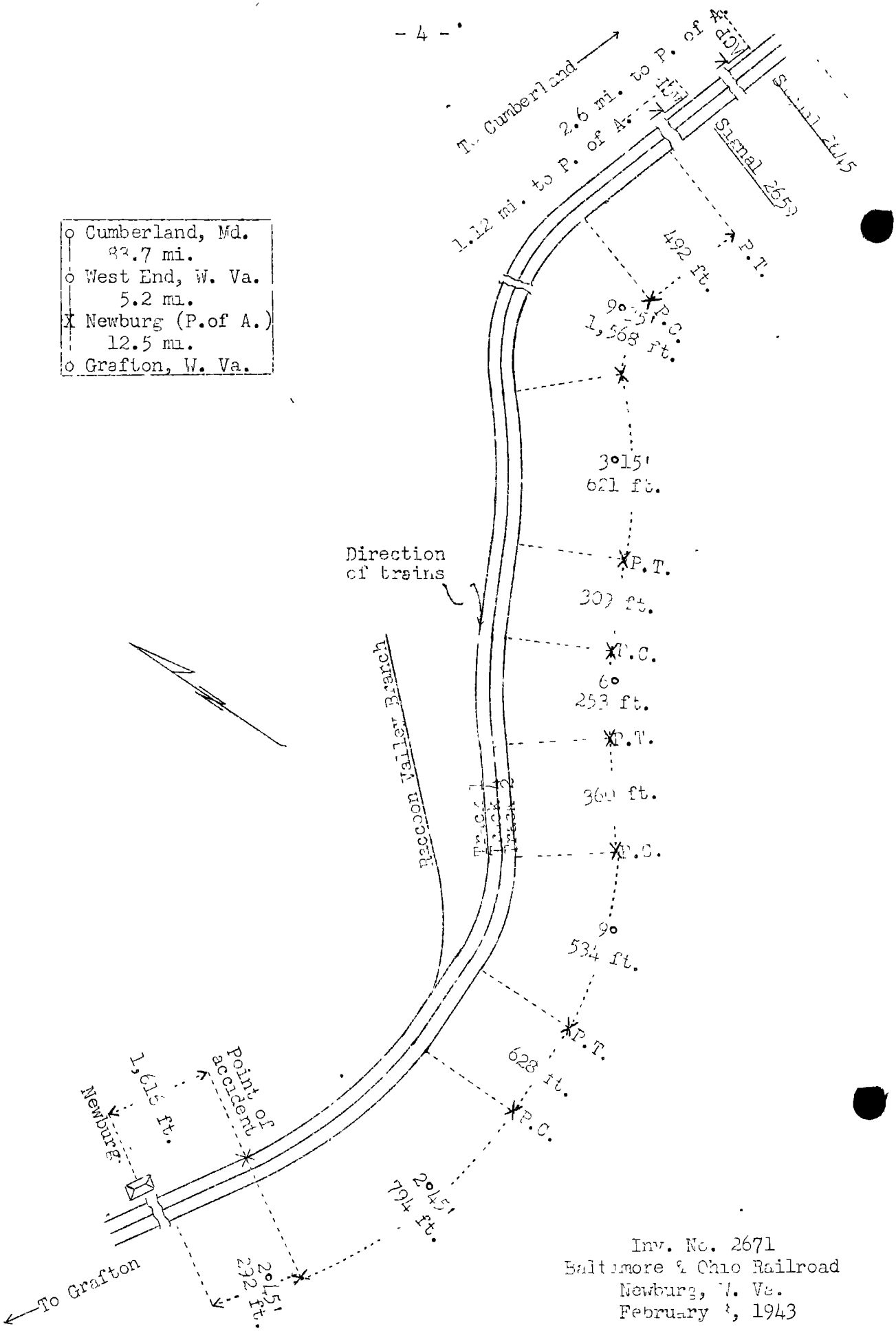
REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On February 8, 1943, there was a rear-end collision between two light engines, coupled, and a freight train on the Baltimore & Ohio Railroad at Newburg, W. Va., which resulted in the death of one train-service employee and the injury of two train-service employees.

---

[1]Under 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.



Inv. No. 2671
Baltimore & Ohio Railroad
Newburg, W. Va.
February 8, 1943

Location of Accident and Method of Operation

This accident occurred on that part of the Cumberland Division designated as the West End and extending between Cumberland, Md., and Grafton, W. Va., a distance of 101.4 miles. In the immediate vicinity of the point of accident this is a 3-track line. The tracks from north to south are, No. 1, westward main, No. 4, either-direction main, and No. 2, eastward main. Trains moving with the current of traffic on tracks Nos. 1 and 2 and in either direction on track No. 4 are operated by an automatic block-signal system, the indications of which supersede time-table superiority. The accident occurred on track No. 1 at a point 1,616 feet east of the station at Newburg. Approaching from the east there are, in succession, a tangent 492 feet in length, a 9°35' curve to the left 1,568 feet, a 3°15' curve to the right 621 feet, a tangent 309 feet, a 6° curve to the left 253 feet, a tangent 360 feet, a 9° curve to the right 554 feet, a tangent 628 feet, and a 2°45' curve to the right 794 feet to the point of accident and 292 feet beyond. The grade for west-bound trains varies between 1.98 and 1.98 percent descending a distance of 5.01 miles, and then is 0.79 percent descending 619 feet to the point of accident and 1.4 miles beyond.

Automatic signals 2645 and 2659, governing west-bound movements on track No. 1, are located, respectively, 2.6 and 1.12 miles east of the point of accident. These signals are of the color-position-light type, and are approach lighted. The involved aspects and corresponding indications and names are as follows:

Signal 2645

Aspect	Indication	Name
White light above two yellow lights in diagonal position.	Proceed preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed.	Approach

Signal 2659

White light above two red lights in horizontal position.	Stop then proceed at restricted speed.	Stop and Proceed

Operating rules read in part as follows:

SPEED RESTRICTIONS.

* * *

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.

35. The following signals must be used by flagmen:

Day Signals--A red flag,
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; * * *

* * *

100.(A). Light engines (with enginemen and fireman only) stopped by preceding train, will be protected by the flagman of the preceding train until called in, at which time the fireman of the light engine will protect his own engine, as per Rule 99. * * *

Time-table special instructions read in part as follows:

8. * * *

Freight trains descending Newburg, * * * Grades, will be spaced 10 minutes behind light engines and other freight trains. * * *

11. Air Brakes, Hand Brakes, Testing, Etc.

* * *

* * * On trains of empty cars or mixed trains of loads and empties, as many retainers will be placed in the low pressure position as in the judgment of the engineman are necessary to properly control the speed of the train.

* * *

In the vicinity of the point of accident the maximum authorized speed for freight trains is 25 miles per hour.

Description of Accident

Extra 4204 West, a west-bound local freight train, consisting of engine 4204, 21 cars and a caboose, departed from West End, 5.2 miles east of Newburg and the last open office, at 4:20 p. m., according to the dispatcher's record of movement of trains, stopped at RV Jct., 0.46 mile east of Newburg, to perform switching service, then proceeded westward and stopped at Newburg about 4:45 p. m. with its rear end standing 1,020 feet east of the station. Soon afterward a track motor-car stopped on the westward track at a point 156 feet to the rear of Extra 4204.

Extra 7101 West consisted of engines 7101 and 7211, coupled and headed eastward. This train departed from West End at 5:10 p. m., according to the station record of train movements, stopped at signal 2659, which displayed stop-and-proceed, then proceeded and stopped at a point 598 feet to the rear of Extra 4202. At 5:38 p. m. the rear end of this train was struck by Extra 7152 West.

Extra 7152 West, a west-bound freight train, consisted of engine 7152, 69 empty cars and a caboose. At Cumberland, Md., 88.9 miles east of Newburg, a terminal air-brake test was made. The brakes were used to control the speed of the train at various points en route and functioned properly at all points where used prior to the accident. This train departed from Cumberland at 11:40 a. m., according to the dispatcher's record of movement of trains, passed West End at 5:21 p. m., passed signal 2645, which displayed approach, stopped at signal 2659, which displayed stop-and-proceed, then proceeded, and while moving at an estimated speed of 20 to 25 miles per hour it collided with Extra 7101.

From the right side of a west-bound engine the view of the point of accident is restricted to 619 feet, because of track curvature and the wall of a hillside cut which has a maximum height of about 14 feet.

The force of the impact moved engines 7101 and 7211 westward 72 feet. The front end of engine 7101 was slightly damaged. The No. 1 driving-wheel assembly of engine 7211 was derailed. The engine truck, the front deck-plate, both cylinder heads, and the main frame of the No. 1 engine were broken. The engine of Extra 7152 stopped 42 feet west of the point of collision. The No. 1 pair of driving wheels was raised above the rails. The engine truck, the front deck-plate, the admission and the exhaust steam pipes of the No. 1 engine, and the articulation casting of the No. 2 engine were broken. The third car was buckled but remained in line with the track. The ninth

to twelfth cars, inclusive, were derailed and stopped at various angles to the track. The third and tenth cars were destroyed. The thirteenth car was damaged.

It was clear at the time of the accident, which occurred at 5:38 p. m.

The employee killed was the front brakeman of Extra 7132 and the employees injured were the engineer and the fireman of Extra 7132.

Data

Engine 7132 was provided with No. 6-ET air-brake equipment, an A-5 brake-pipe feed valve, 2 cross-compound compressors, a B-6 reducing valve, an E-6 safety valve and an SD compressor governor. A brake-pipe vent valve was provided on the tender. The caboose and 14 cars were equipped with AB valves, and the remainder with K triple valves. After the accident, tests disclosed that the air-brake equipment of engine 7132 functioned as intended except that the reducing valve, which is required to be adjusted to a brake-cylinder pressure of 45 pounds, permitted pressure to rise to 68 pounds. An air-brake test of 63 undamaged cars disclosed that the brake-cylinder piston travel varied between 5 and 11 inches. The brake-cylinder piston travel on 10 cars exceeded 9 inches. One brake released before the test was completed. Of the 15 cars equipped with AB valves, 12 were cars owned by the carrier involved.

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 a light engine is stopped by a preceding train, the flagman of the preceding train must provide protection for the light engine until he is recalled. When a flagman is 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, a stop-and-proceed indication requires a train to stop at the signal, then it may proceed at restricted speed and must be prepared to stop short of a train, obstruction, or anything that may require the speed of a train to be reduced. All surviving employees involved understood these requirements.

Extra 4204 West stopped on the main track at Newburg about 4:45 p. m., with the rear end 1,020 feet east of the station. About 5:03 p. m., Extra 7101 West, consisting of two light engines headed east, stopped at a point 598 feet to the rear of Extra 4204. About 5:38 p. m. the rear end of Extra 7101 was struck by Extra 7132 West.

As Extra 7132 was descending the grade east of Newburg, 15 pressure-retaining valves on the rear end and about 25 on the front end were set for use. Brake-pipe pressure was 70 pounds. This train stopped at signal 2659, which displayed stop-and-proceed, then after an interval of about 4 minutes it proceeded. The engineer said that his train was stopped at signal 2659 as a result of a 15-pound brake-pipe reduction. After the brake-pipe pressure was restored, the slack from the rear ran in and started the train. When the engine reached a point about 700 feet west of signal 2659 the speed was about 10 miles per hour and the engineer made a 5-pound brake-pipe reduction, then when the speed was slightly reduced he released the brakes. When the engine reached a point about 1,700 feet west of signal 2659, the speed was about 12 miles per hour and the engineer made a 6-pound brake-pipe reduction. The train proceeded about 900 feet farther and the brakes were released. At this time the speed had not been materially reduced. The train had proceeded about 1,000 feet farther and the speed was about 15 miles per hour when the engineer made a 10-pound reduction. About 10 seconds after the brake-pipe exhaust ceased, because of the slack running in and the speed not being reduced by this application, the engineer moved the brake valve to emergency position, but with no appreciable result. During the service brake applications, the engine and tender brakes were held released; however, after the emergency application was made the engine and tender brakes were applied. The enginemen said that no lighted fusee was encountered between West End and the point of accident, that one torpedo was exploded about 2,000 feet east of Extra 7101, and that they did not see a flagman until the engineer observed a red flag being waved from a point about 500 feet distant, and Extra 7101 was about 100 feet beyond. The engineer opened the sander valve and placed the reverse lever in position for backward motion, but the speed was about 20 miles per hour when he jumped at a point about 100 feet east of the preceding train. The brakes of Extra 7132 had functioned properly at all points where used east of signal 2659, and the engineer was able to control the speed properly on another descending grade steeper than Newburg grade. He said that the brakes were applied and released in accordance with his understanding of the instructions, and the gauge indicated that the brake-pipe pressure was restored between each release and application; however, when the brakes were applied the last time prior to the accident, the brake-pipe exhaust ceased after a shorter interval than normal for the length of the train. Because of the 10-pound brake-pipe reduction made prior to the emergency application of the brakes, he was of the opinion that the full benefit of the emergency application was not obtained. Furthermore, the slack surged in severely after the emergency application was made. The engineer said he was confident the train could be stopped in accordance with any condition which might arise, and was not alarmed until after the third service application failed to control the speed properly. Apparently, the auxiliary-reservoir pressure had not

been fully restored at the rear of the train and the speed was too great for the effective brakes to control the train when the third application was made. If the speed had been so controlled that the auxiliary-reservoir pressure could have been restored prior to the third application this accident could have been averted.

Flag protection was required for Extra 7101 after this train stopped, and the flagman of Extra 4204 was required to furnish flag protection after Extra 7101 stopped at the rear of his train. According to the statement of the flagman of Extra 4204, when his train stopped at RV Jct. to perform switching service he proceeded to the rear to provide flag protection. Before his train proceeded to Newburg, about 2,430 feet westward, he was recalled, and he left a lighted fusee and two torpedoes about 2,300 feet east of RV Jct. After his train stopped at Newburg he stationed himself at a point about 1,650 feet to the rear of his train. He said that a motor-car exploded the torpedoes he had left east of RV Jct., and one of the section men placed other torpedoes at that point; however, the section foreman said that the torpedoes were exploded about 1,000 feet east of RV Jct. and other torpedoes were placed at the same location. Members of the crew of Extra 7101 said that torpedoes were exploded a short distance east of the flagman. About 5:35 p. m. the flagman was recalled by the engine whistle of his train and, leaving a lighted fusee and torpedoes about 1,300 feet east of the light engines, he proceeded westward. He had reached a point about 600 feet east of the light engines when he heard torpedoes exploded by Extra 7132 and, running eastward, he gave stop signals with a red flag, but Extra 7132 passed him and collided with the light engines.

The rules require that flag protection be provided a sufficient distance for following trains to stop from their maximum authorized speed. Automatic block signal indications do not dispense with the observance of this rule. From the time that Extra 4204 stopped at Newburg until the collision occurred the flagman had about 1 hour in which to provide flag protection. He said that he could have proceeded a considerable distance eastward but did not consider it necessary. He knew that his train would occupy tracks Nos. 2 and 4 in performing switching, and he remained near a telephone 1,500 feet east of the rear of his train in order that he could receive necessary information concerning flag protection for these tracks. However, after Extra 7101 stopped to the rear of Extra 4204, the distance that the flagman provided protection was shortened about 800 feet. The engineer of Extra 7132 said that if torpedoes and a lighted fusee had been left at a point about 2,000 feet farther east he could have controlled the speed of his train at that point and could have stopped short of Extra 7101. If the flagman had gone back a sufficient distance in

furnishing flag protection and had left a lighted fusee and torpedoes before he started to return to his train, this accident would have been prevented.

The investigation disclosed a lack of understanding of a number of rules and special instructions. Before the train of Extra 4204 was assembled and the brake-pipe hose coupled at RV Jct., the whistle signal was sounded for the flagman to return, although the train was to be moved only 0.46 mile. All members of this crew knew that considerable switching was to be performed at Newburg. If the flagman had not been recalled at this point he would have been stationed a considerable distance east of the point of accident. Several employees said that dependence is placed upon automatic block-signal indications in providing flag protection; otherwise, it would be necessary for a flagman to proceed to the rear about 3/4 mile. Several employees did not know the maximum authorized speed in the territory involved, nor the minimum running time between West End and Newburg. In previous reports the Commission has commented on inadequate flag protection on the line of this railroad and lax observance of other operating rules. Recently this railroad added a number of supervisory officials whose duties consist chiefly of instructing employees on operating rules and in supervising their observance of the rules. These measures have not yet corrected the lax practices.

On the descending grade involved, pressure-retaining valves are required to be set for use on all loaded cars but the number on empty cars is not designated. The engineer instructs the front brakeman as to the number to be set for use on the front portion of the train and the conductor instructs the flagman concerning the number to be set on the rear portion. This results in a wide variation in the number of retaining valves used. In addition, when trains of empty cars are dispatched, the rules do not require that a retaining-valve test be made. This results in a crew having no knowledge as to the efficiency of the retaining valves. The manner in which Extra 7132 moved between signal 2659 and the point of accident indicates that there was either an insufficient number of retaining valves set for use, or a considerable number were not efficient. After the accident, an air-brake test disclosed that of the 63 undamaged cars, 10 had excessive brake-cylinder piston travel and 1 brake released before the test was completed. Rules of this carrier require that piston travel be not more than 9 inches. If the piston travel of all cars had been properly adjusted, the brakes would have been more efficient. Of the total of 70 cars in the train, 15 were equipped with AB valves and the remainder with K valves. Had a majority been equipped with AB valves, an emergency application of the brakes could have been obtained throughout the train. The engineer of Extra

7132 and the supervisor of locomotive operation thought that if all cars had been equipped with AB valves Extra 7132 could have been stopped short of the preceding train by an emergency application made at the point where the brake valve was moved to emergency position. This carrier has not kept pace with the program of equipping cars in service with AB brakes within the 10-year period beginning in 1935, as established by the Association of American Railroads. Over 75 percent of this period had elapsed at the time of this investigation, and the Baltimore & Ohio Railroad had equipped only 24.9 percent of its cars with AB brakes. Of the cars in the train of Extra 7132, 67 were owned by the carrier involved. Progress in installing AB equipment should be greatly accelerated. Under the stress of present traffic conditions, it is important that the advantages of this improved equipment be made available as rapidly as possible. Investigations have disclosed that in many instances if freight trains involved in accidents had been equipped with AB valves, the accidents would have been averted or their consequences greatly lessened. Accidents of this character usually result in much-needed motive-power units and cars being destroyed, or being out of service for a considerable period for repairs that require critical material.

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 indication.

Dated at Washington, D. C., this second day of March, 1943.

By the Commission, Commissioner Patterson.

W. P. BARTEL,

(SEAL)

Secretary.