

No. 13413

IN THE MATTER OF AUTOMATIC TRAIN-CONTROL
DEVICES

DELAWARE, LACKAWANNA & WESTERN RAILROAD

Submitted March 10, 1933. Decided March 10, 1933

1. Petition of the Delaware, Lackawanna & Western Railroad Company that orders of June 13, 1922, and January 14, 1924, as amended, be modified, insofar as those orders affect petitioner, to permit operation by petitioner of locomotives equipped with automatic cab signals in lieu of automatic train-control devices, granted. Former reports, 115 I.C.C. 270 and 153 I.C.C. 73.
2. Specifications and requirements for continuously controlled automatic cab-signal system to be installed and operated by the Delaware, Lackawanna & Western Railroad Company, in lieu of automatic train-control devices, prescribed.

E. M. Rine for petitioner.

REPORT OF THE COMMISSION ON FURTHER CONSIDERATION

DIVISION 6, COMMISSIONERS EASTMAN, McMANAMY, AND LEE

McMANAMY, *Commissioner*:

This proceeding was reopened upon petition of the Delaware, Lackawanna & Western Railroad Company, and considered upon the facts set forth in said petition, supplemented by records of the commission, without further hearing.

The Delaware, Lackawanna & Western seeks relief from the requirements of our orders of June 13, 1922, and January 14, 1924, as amended, and requests that these orders be further modified so as to permit the operation on its line between East Buffalo, N.Y., and Scranton, Pa., of locomotives equipped with automatic cab signals in lieu of automatic train-control devices.

As set forth in the petition and as shown by our records, the carrier, under our order of June 13, 1922, equipped its double-track line between East Buffalo and Elmira, N.Y., a distance of 141 miles, with an automatic train-control system of the continuous one-speed type; this system is superimposed upon an automatic block-signal system, the signals being of the normal-clear, 2-arm, 2-position lower-quadrant type. On this division two caution indications are given for each stop indication except at the eastward signals approaching the Pennsylvania Railroad and Erie Railroad crossings, where three
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caution indications are given, and at certain signals on ascending grades where but one caution indication is provided.

Under our order of January 14, 1924, the installation of this automatic train-control system was extended to cover 115.5 miles of road and 264.48 miles of track between Elmira, N.Y., and Scranton, Pa. The signals on this portion of the line are similar to those in use on first-order territory except that between Binghamton and Elmira 57 miles of double-track are equipped with 3-indication color-light signals.

The carrier now has 216 locomotives equipped with the automatic train-control devices which are so designed that a train may proceed at authorized speed without interference from the devices until a restrictive condition is encountered, when a restrictive cab indication is displayed an automatic application of the brakes is initiated unless the engineman operates the acknowledging device and takes immediate action to reduce the speed of the train below the predetermined low-speed limit imposed by the speed governor, after which the train may proceed at a rate not exceeding the imposed restricted speed limit until the restrictive condition in the controlling section has been removed. In case the predetermined low-speed limit is exceeded while in the restrictive zone, the brakes are automatically applied.

The speed-limit indicator unit, the aspects of which are two roundels, yellow for restrictive indication and green for proceed, is located directly in front of the engineman's seat in a position clearly visible to him in his accustomed place and indicates to the engineman at all times the condition of the track ahead and the prescribed speed limit.

The expenditures for maintenance and operation of automatic train-control devices for the years 1928 to 1931, allocated to roadway and to locomotive equipment have been as follows:

	Wayside	Locomotive	Total
Buffalo division:			
Year 1928.....	\$4,906.20	\$42,459.36	\$47,365.56
Year 1929.....	5,080.31	42,860.64	47,940.95
Year 1930.....	4,215.58	36,800.07	41,015.63
Year 1931.....	4,307.79	33,704.95	38,012.74
Scranton division:			
Year 1929.....	5,050.89	68,312.56	73,363.45
Year 1930.....	5,128.91	70,999.09	76,128.00
Year 1931.....	5,361.62	59,737.28	65,098.90

Based upon maintenance costs for the year 1932, the substitution of an automatic cab-signal system for the automatic train-control devices, as proposed by petitioner, will effect an estimated annual saving of \$24,384.

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It is the contention of the carrier that the removal of that portion of the locomotive equipment which effects automatic applications of the brakes will eliminate a considerable number of train stops attributable to undesired applications of the brakes which interfere with normal train movement and add materially to the cost of operation because of stopping and starting as well as expenses resulting from delay to trains and traffic.

In its petition the carrier submitted the following tabulation for the purpose of showing the decrease in traffic density on its automatic train-control equipped tracks:

Period	Divisions	Traffic density
Year 1925 (6 mos.).....	Buffalo only.....	28.15
Year 1926.....	do.....	29.40
Year 1927.....	do.....	30.29
Year 1928.....	Buffalo and Scranton.....	29.65
Year 1929.....	do.....	28.25
Year 1930.....	do.....	23.50
Year 1931.....	do.....	20.90
Year 1932 (10 mos.).....	do.....	17.85

This decrease in traffic is directly reflected in the operating revenues which, as shown by the following statement, have decreased from a maximum net operating income after taxes, interest, and other fixed charges have been deducted in 1926 of \$17,913,201 to a minimum of \$2,542,447 net operating income loss for the year 1932.

	Total operating revenue	Net operating revenue	Net after taxes, interest, and other charges
Year 1926.....	\$88,804,745	\$26,427,256	¹ \$17,913,201
Year 1927.....	84,685,830	24,502,770	¹ 15,707,772
Year 1928.....	81,135,181	23,159,894	¹ 13,129,541
Year 1929.....	81,743,222	24,023,312	¹ 13,340,130
Year 1930.....	69,661,490	17,048,638	¹ 6,082,575
Year 1931.....	58,674,838	12,534,172	¹ 1,090,690
Year 1932.....	46,447,856	9,392,277	Def. 2,542,447

¹ Before deductions for dividends.

The necessity for drastic retrenchment wherever it can be brought about without sacrificing safety forms the basis upon which the carrier predicates its petition. Notwithstanding the great reduction in net revenues, it is the intention of the petitioner that any saving resulting from the removal of the apparatus which automatically controls the air brakes shall be applied to the continuation of such safety measures as are already under way or which may be found desirable in the future.

In supporting the proposed change, operating officials as well as enginemen have given as their opinion that the advantage of auto-

matically applying the brakes in case of failure of the engineman to observe and obey signal indications will be offset by the use of duplicate cab signals, one for the engineman and one for the fireman, with a loud whistle which will continue to sound until a restrictive cab-signal indication has been acknowledged.

The automatic train-control devices as installed on the Delaware, Lackawanna & Western are so designed that a speed limit of 20 miles per hour is imposed under which a locomotive must be operated at all times when the automatic block signals display restrictive indications. The Delaware, Lackawanna & Western has not found the imposition by the automatic train-control devices of a low-speed restriction at the first restrictive wayside-signal location to be burdensome, and as set forth in its petition it is the opinion of the carrier, with which we agree, that a 2-indication cab-signal system supplemented by a rule which imposes a low-speed restriction, braking distance from a stop signal or at the first approach indication, will adequately safeguard train movements on its line between East Buffalo and Scranton. Petitioner proposes to provide cab signals having standard-signal aspects and to revise operating rules so as to impose a speed limit of 10 miles per hour when a restrictive indication is displayed.

In consideration of the facts herein noted, we find that our orders of June 13, 1922, and January 14, 1924, as amended, insofar as such orders affect the Delaware, Lackawanna & Western Railroad, should be modified to permit it to use, on its line between East Buffalo and Scranton, an automatic cab-signal system in lieu of automatic train-stop or train-control devices as now required by said orders.

The specifications and requirements for automatic train-stop and train-control devices which were prescribed by our original orders are not applicable in their entirety to automatic cab-signal devices; therefore, specifications and requirements for a continuously controlled automatic cab-signal system for installation and operation by the Delaware, Lackawanna & Western Railroad Company in lieu of automatic train-control devices will be prescribed.

An appropriate order will be entered.

APPENDIX

Order of the Commission

This proceeding having been reopened for further consideration upon petition of the Delaware, Lackawanna & Western Railroad Company for modification of our orders of June 13, 1922, and January 14, 1924, as amended insofar as those orders affect petitioner, and investigation of the matters and things involved having been had, and the division having on the date hereof made and filed a report on further consideration containing findings of fact and conclusions thereon, which report is hereby referred to and made a part hereof:

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It is ordered, That our orders in the above proceeding, dated June 13, 1922, and January 14, 1924, as amended, insofar as they apply to the Delaware, Lackawanna & Western Railroad Company be, and they are hereby, amended to permit the Delaware, Lackawanna & Western Railroad Company to install and operate upon its line between East Buffalo, N.Y., and Scranton, Pa., an automatic cab-signal system conforming to specifications herein prescribed in lieu of the automatic train-control system now installed and operated on that portion of its line.

It is further ordered, That the said installation of automatic cab-signal devices, when completed, shall be subject to inspection by and the approval of the commission or any division thereof to which the matter may be referred.

It is further ordered, That in all other respects the said orders of the commission, as amended, shall remain in full force and effect.

SPECIFICATIONS AND REQUIREMENTS FOR CONTINUOUS AUTOMATIC CAB-SIGNAL
SYSTEM

Definitions

For purpose of these specifications the following definitions will apply:

Automatic cab-signal system.—A system which provides for the automatic operation of the following: (a) *Cab signal*, a device located in the cab which, when locomotive and roadway apparatus are in operative relation, displays indications of conditions in advance, and (b) *cab indicator*, a device located in the cab which indicates a condition or a change of condition of one or more elements of the system.

Block.—A length of track of defined limits, the use of which by trains is governed by fixed signals or cab signals or both.

Cab.—The compartment occupied by engineman, fireman, or motorman, of the engine, motor car or multiple-unit car from which the propelling power of the train is controlled.

Continuous control.—A type of control in which the locomotive apparatus is constantly in operative relation with the track elements and is immediately responsive to a change of conditions in the controlling section which affect train movement.

Controlling section.—A length of track of one or more track circuit sections by which the track elements governing approach to or movement within a block are controlled.

Locomotive.—A self-propelled unit of equipment used in train service.

Track element.—That portion of the roadway apparatus to which the locomotive apparatus is directly responsive.

Specifications

1. The purpose of these specifications is to prescribe essential features involved in the design, construction, installation, operation, and maintenance of automatic cab-signal systems of the continuously controlled type, without automatic train control.

2. The automatic cab-signal system shall function to display a cab-signal indication which constantly corresponds with conditions in advance in the controlling section.

3. The automatic cab-signal system shall be so arranged that a change of conditions affecting train movement which occurs within braking distance in advance will result immediately, regardless of the location of the locomotive
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in the controlling section, in a change of cab-signal indication corresponding with these changed conditions.

4. The automatic cab-signal system shall be so arranged that when a locomotive enters and is within a block in which there exists a condition causing a restrictive indication the cab signal will display the most restrictive indication required by that condition.

5. The automatic cab-signal system shall be so arranged that when the cab signal changes to display a more restrictive indication an audible cab indicator will sound and continue to sound until acknowledged.

6. The automatic cab-signal system shall be so interconnected with the fixed-signal system that the cab signal will display indications consistent with the indications of the fixed signals, except when a fixed signal displays a less restrictive indication than is required or warranted by existing conditions.

7. The cab signals shall be plainly visible to members of the locomotive crew when they are in their accustomed stations in the cab.

8. The cab indicator shall have a distinctive sound which will be clearly audible to members of the locomotive crew under all operating conditions when they are in their accustomed stations in the cab.

9. The automatic cab-signal system shall be so constructed that the cab signal will, so far as practicable, display its most restrictive indication if an essential part fails or is removed, or a break, cross, or ground occurs in electric circuits, or in case of a failure of energy.

10. The apparatus shall be so constructed that proper operative relation between the parts along the roadway and the parts on the locomotive will be assured under all conditions of speed, weather, wear, oscillation, and shock.

11. The apparatus shall be so constructed as not to interfere with the application of the brakes by operation of the engineman's brake valve or to impair the efficiency of the air-brake system.

12. The apparatus shall be so constructed that it may be applied so as to be operative when the locomotive is running forward or backward.

13. The apparatus shall be so constructed that it will operate under all weather conditions which permit train movements.

14. The apparatus shall be so constructed as to conform to established clearances for equipment and structures.

15. The apparatus shall be so constructed and installed that it will not constitute a source of danger to trainmen, other employees, or passengers.

16. The apparatus shall be so constructed, installed, and maintained as to be safe and suitable for service. The quality of materials and workmanship shall conform to this requirement.

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