

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3671

THE PENNSYLVANIA RAILROAD COMPANY

IN RE ACCIDENT

NEAR BRADLEY JCT., PA., ON

DECEMBER 3, 1955

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SUMMARY

Date:	December 3, 1955		
Railroad:	Pennsylvania		
Location:	Bradley Jct., Pa.		
Kind of accident:	Head-end collision		
Trains involved:	Freight	:	Freight
Train numbers:	Extra 5811 South	:	Extra 9519 North
Locomotive numbers:	Diesel-electric units 5811 and 5829	:	Diesel-electric units 9519, 9544, and 9684
Consists:	20 cars, caboose	:	Caboose
Speeds:	26 m. p. h.		31 m. p. h.
Operation:	Operating rules and manual-block system		
Track:	Single, 8° curve, 1.01 percent ascending grade southward		
Weather:	Pockets of fog		
Time:	7:35 a. m.		
Casualties:	3 killed; 7 injured		
Cause:	Train occupying block without authority		

INTERSTATE COMMERCE COMMISSION

REPORT NO. 5671

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

THE PENNSYLVANIA RAILROAD COMPANY

February 17, 1956

Accident near Bradley Jct., Pa., on December 3, 1955, caused
by a train occupying a block without authority.

REPORT OF THE COMMISSION¹

CLARKE, Commissioner

On December 3, 1955, there was a head-end collision between two freight trains on the Pennsylvania Railroad near Bradley Jct., Pa., which resulted in the death of three employees, and the injury of seven employees. This accident was investigated in conjunction with a representative of the Pennsylvania Public Utility Commission.

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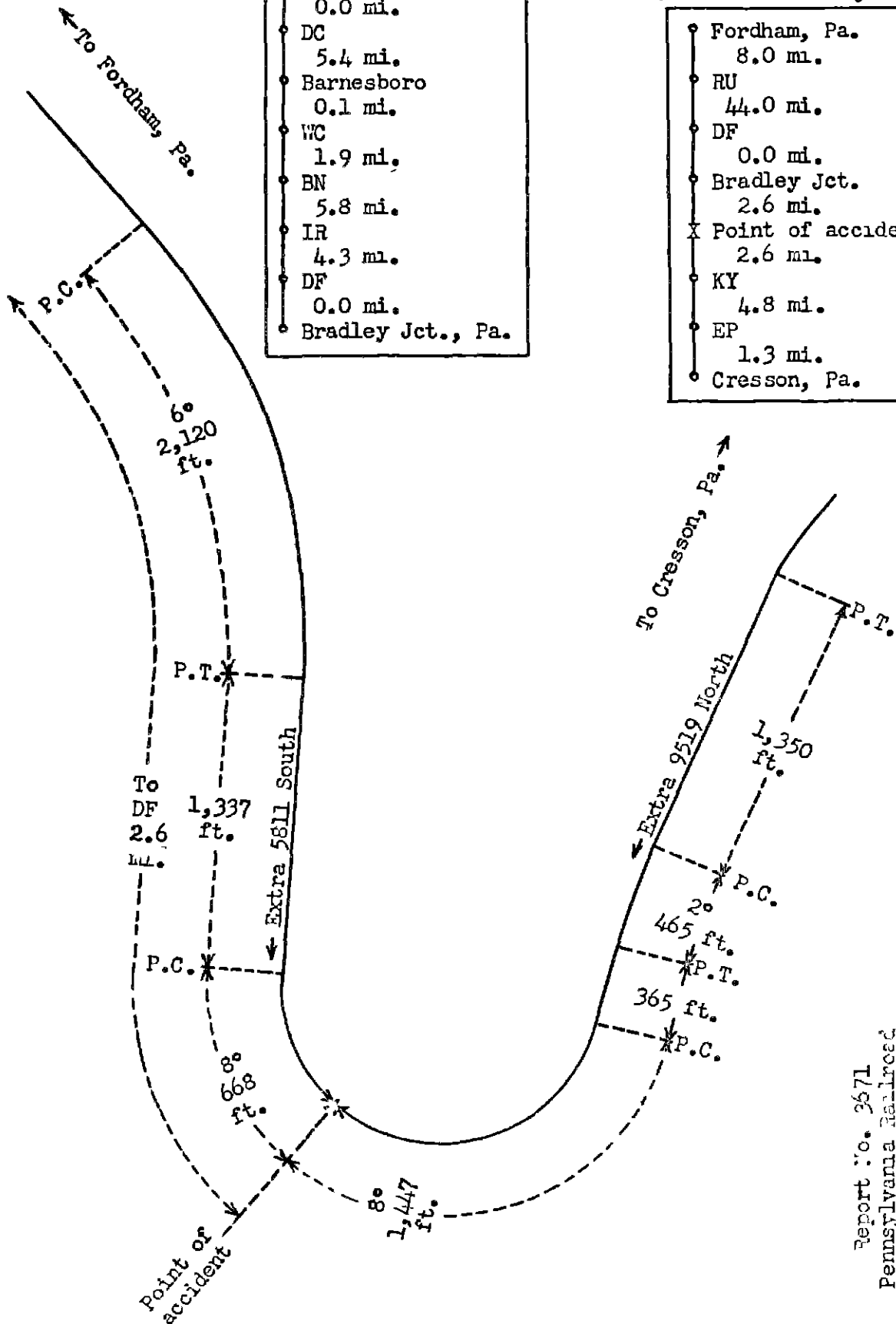
Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Clarke for consideration and disposition.

Susquehanna Secondary Track

- Cherry Tree, Pa.
0.0 mi.
- DC
5.4 mi.
- Barnesboro
0.1 mi.
- WC
1.9 mi.
- BN
5.8 mi.
- IR
4.3 mi.
- DF
0.0 mi.
- Bradley Jct., Pa.

Cresson Secondary Track

- Fordham, Pa.
8.0 mi.
- RU
44.0 mi.
- DF
0.0 mi.
- Bradley Jct.
2.6 mi.
- X Point of accident
2.6 mi.
- KY
4.8 mi.
- EP
1.3 mi.
- Cresson, Pa.



Report No. 3671
 Pennsylvania Railroad
 Near Bradley Jct., Pa.
 December 3, 1955

Location of Accident and Method of Operation

This accident occurred on that part of the Pittsburgh Division designated as the Cresson secondary track, which extends between Fordham and Cresson, Pa., 63.3 miles. In the vicinity of the point of accident this is a single-track line, over which trains are operated by operating rules and a manual-block system. At Bradley Jet., 52.0 miles south of Fordham, a line designated as the Susquehanna secondary track converges with the Cresson line from the northwest at a spring switch which is a trailing-point for south-bound movements. The Susquehanna secondary track extends between Cherry Tree, Pa., and Bradley Jet., 17.5 miles. In the vicinity of Bradley Jet. it is a single-track line, over which trains are operated by operating rules and a manual-block system. A block-limit station designated as DF is located on the Susquehanna secondary track 794 feet north of the junction switch at Bradley Jet. The accident occurred on the Cresson secondary track at a point 2.6 miles south of this block-limit station. From the north there are, in succession, a compound curve to the right, having a maximum curvature of 6°, 2,120 feet in length, a tangent 1,337 feet, and an 8° curve to the left 668 feet to the point of accident and 1,447 feet southward. From the south there are, in succession, a tangent 1,350 feet in length, a 2° curve to the left 465 feet, a tangent 365 feet, and the curve on which the accident occurred. The grade for south-bound trains is approximately 1.00 percent ascending throughout a considerable distance immediately north of the point of accident and is 1.01 percent ascending at that point. The grade for north-bound trains averages 0.54 percent descending throughout a distance of approximately 1,000 feet south of the point of accident.

At Bradley Jet. a siding 3,288 feet in length parallels the Susquehanna and the Cresson secondary tracks on the west. The north siding-switch is located on the Susquehanna line 238 feet north of DF block-limit station, and the south siding-switch is located on the Cresson secondary track at a point 3,050 feet south of this station.

The block-limit signal at DF consists of a red light and a yellow light arranged horizontally, with the yellow light placed next to the track governed, above the reflectorized letters "DF", arranged vertically, in white on a black background. This signal is mounted on a post adjacent to the east rail of the Susquehanna secondary track, with the bottom of the signal approximately 7 feet 6 inches above track level. The day and the night aspects are visible from either direction.

The block in which the accident occurred extended between DF block-limit station on the Susquehanna secondary track and KY block-limit station on the Cresson secondary track. KY is 57.2 miles south of Fordham. All block-limit stations on the Cresson and Susquehanna secondary tracks are controlled by the signalman at EP block station, 1.3 miles north of Cresson.

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

DEFINITIONS

Block—A length of track of defined limits, the use of which by trains is governed by block signals, block-limit signals * * *

Manual Block Signal System—A block signal system wherein the use of each block is governed by block signals controlled manually or by block-limit signals or both upon information by telephone or other means of communication.

Block-Limit Signal—A fixed signal indicating the limit of a block the use of which by trains is prescribed by manual block signal system rules.

Block-Limit Station—A place at which a block-limit signal is displayed.

Fixed Signal—A signal of fixed location indicating a condition affecting the movement of a train or engine.

Secondary Track—A designated track upon which trains and engines may be operated without time-table authority, train orders * * *

34. Immediately upon seeing a fixed signal 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.

106. Both the conductor and the engineman are responsible for the safety of the train and the observance of the rules * * *

305. * * *

At a block-limit station trains will be governed in their use of the block by instructions of the signalman in charge of the block-limit station as indicated on the time-table.

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317. (For absolute block for opposing movements and permissive block for following movements on the same track.)

Before admitting a train to a block under Clear-block signal, the signalman in charge of the block station or block-limit station at the entrance of the block must know that the block is clear of all trains and that no other train has been given permission or a signal to enter the block. * * * The signalman in charge of a block-limit station may give a train at that block-limit station verbal permission to enter one block. The signalman, when authorized by the superintendent, will issue Clearance Card (Form K) to a train to pass one or more block-limit stations as though Clear-block signal were displayed.

Before admitting a train other than a passenger train to a block, the signalman in charge of the block station or block-limit station at the entrance of the block must know that the block is clear of opposing trains and * * * that no opposing train * * * has been given permission or a signal to enter the block. * * *

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361. * * *

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Unless otherwise provided, trains must stop at block-limit stations and the conductor or engineer must communicate with the signalman in charge as to the condition of the next block. * * *

4134-B. * * *

Trainphone is to be used in train operations as follows

* * *

For the signalman in charge of a block-limit station to give a train approaching that block-limit station verbal permission to enter one block.

* * *

Timetable special instructions provide that between PU block-limit station, 8.0 miles south of Fordham, and FP on the Cresson secondary track, and between DC block-limit station

at Cherry Tree and DF block-limit station on the Susquehanna secondary track, rules for movement by train order do not apply. All other rules as they apply to main tracks and sidings are in effect. Extra trains, except passenger extras, run on verbal permission of the signalman when authorized by the superintendent. The signalman gives such permission in the form of block authority.

The maximum authorized speed for freight trains is 30 miles per hour, but it is restricted to 25 miles per hour on curves in the vicinity of the point of accident.

Description of Accident

Extra 5811 South, a south-bound freight train, consisted of Diesel-electric units 5811 and 5829, coupled in multiple-unit control, 20 cars, and a caboose. It was assembled on the Susquehanna line at Barnesboro, 14.7 miles north of the point of accident. While the crew was performing switching service at this point the conductor copied and delivered to the engineer a clearance card Form K which contained instructions for the train to proceed as though clear-block signal were displayed, without reporting clear, at WC, BN, and IR block-limit stations, located, respectively, 14.6 miles, 12.7 miles, and 6.9 miles north of the point of accident. This train departed from Barnesboro about 6:40 a. m., passed the block-limit stations at which it was authorized to proceed, passed DF block-limit station, where it was required to stop until permission was received to enter the next block, entered the Crossen secondary track, and while moving at a speed of about 26 miles per hour it collided with Extra 9519 North at a point 2.6 miles south of Bradley Jet.

Extra 9519 North, a north-bound train in mine-run freight service, consisted of Diesel-electric units 9519, 9544, and 9684, coupled in multiple-unit control, and a caboose. At EP members of the crew received copies of a clearance card Form K which contained instructions for the train to proceed as though clear-block signal were displayed, without reporting clear, at KY block-limit station, and to enter the siding at DF and report clear. This train departed from EP on a clear-block indication at 7:21 a. m., passed KY block-limit station, and while moving at a speed of about 31 miles per hour it collided with Extra 5811 South.

The locomotive, the first three cars, and the front truck of the fourth car of Extra 5811 South were derailed. The first Diesel-electric unit overturned to the west and stopped on its side with the front end approximately 25 feet south of the point of collision and 20 feet west of the track.

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The rear end stopped on the track structure. The front end of this unit was demolished. The second Diesel-electric unit stopped upright approximately in line with the track. The derailed cars stopped in various positions on or near the track. The first Diesel-electric unit was badly damaged, and the second unit was considerably damaged. The first two cars were destroyed, and the third car was badly damaged. The first and second Diesel-electric units of the locomotive of Extra 9519 North were derailed, and the caboose of this train was moved off center at both ends. The first Diesel-electric unit was derailed to the west, and the front end was moved through an angle of approximately 120 degrees by the impact of the collision. This unit stopped upright with the front end approximately 30 feet south of the point of collision and 50 feet west of the track, and the rear end immediately west of the track. The front end and the control compartment of this unit were demolished. The second Diesel-electric unit stopped upright approximately in line with the track. Both units were badly damaged. The caboose was slightly damaged.

The engineer and the fireman of Extra 5811 South, and the engineer of Extra 9519 North were killed. The conductor and the swing brakeman of Extra 5811 South, and the fireman, the conductor, the front brakeman, the swing brakeman, and the flagman of Extra 9519 North were injured.

The weather was hazy and there were pockets of fog at the time of the accident, which occurred about 7:35 a. m.

The locomotives involved were equipped with trainphone apparatus consisting of a telephone handset, loudspeaker, and associated apparatus for communication with similarly equipped locomotives, rolling stock, and stations. Trainphone apparatus is provided in the block station at EP. The cabooses of the trains involved were not so equipped.

Discussion

In this territory extra trains, except passenger extras, run on verbal permission of the signalman when authorized by the superintendent. This permission is given in the form of block authority. The rules provide that at a block-limit station trains will be governed in their use of the block by instructions of the signalman in charge of the block-limit station. The signalman in charge of a block-limit station may give a train at that block-limit station verbal permission to enter one block, and when authorized by the superintendent

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will issue clearance card (Form K) to a train to pass one or more block-limit stations as though Clear-block signal were displayed. Except as otherwise provided, a train must not be admitted to a block which is occupied by an opposing train. A train must not enter a block without proper block-signal indication or permission of the signalman.

On the day of the accident the crew of Extra 5811 South arrived at Barnesboro on a northward trip about 6 a. m. While the train was being assembled for the southward movement the conductor used a wayside telephone to communicate with the signalman at EP and requested authority for the return movement. The signalman then issued a clearance card Form K instructing Extra 5811 South to proceed on clear-block authority, without reporting clear, at the block-limit stations at WC, BN, and IR. The conductor wrote these instructions on a clearance card Form K, and he said that he understood this authorized movement of his train only between Barnesboro and DF block-limit station on the Susquehanna secondary track. The clearance was issued at 6:19 a. m. The conductor then proceeded to the locomotive and delivered it to the engineer. At that time the engineer was changing the controls to operate the locomotive from the control compartment at the south end, and the conductor had no conversation with him. He said that the engineer made it a practice to inform the fireman as to the block authority, and he saw him show the fireman the clearance. The conductor then alighted from the locomotive. The front brakeman said that he did not see the clearance, but the conductor informed him that clear-block authority for movement between Barnesboro and DF block-limit station had been received. The flagman and the swing brakeman said that they had remained in the vicinity of the rear end of the train and that after the caboose had been placed at the rear they had no further contact with other members of the crew. They said that they did not know what block authority had been issued for the movement of their train. A brake test was made before the train departed from Barnesboro.

As Extra 5811 South was approaching the point where the accident occurred the enginemen were in the control compartment at the front of the locomotive. The conductor and the front brakeman were in the control compartment at the rear of the second unit. The flagman and the swing brakeman were in the caboose. The headlight was lighted. The brakes of this train had functioned properly when used en route. As the train was closely approaching DF block-limit station the speed was materially reduced by a service application of the brakes. The conductor said that this brake application was then released, and when the train passed the block-limit

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station he assumed that the engineer had communicated by trainphone with the signalman at EP and had received verbal permission to enter the next block. He said that it was a regular practice for engineers to use the trainphone to request block authority under such circumstances and, if block authority was received, to proceed, afterward informing the conductor at the first opportunity. The conductor said that he had heard some rumbling sounds on the loudspeaker of the trainphone apparatus when the locomotive was approaching Bradley Jet., but he had been unable to distinguish any conversation. The front brakeman said that the only conversation he heard on the loudspeaker was when the locomotive was a short distance south of BN block-limit station and that this conversation apparently related to a brake test which was being made on another train. The conductor and the front brakeman said that the brakes were applied in emergency immediately before the collision occurred. The members of the crew in the caboose said that they did not know whether the brakes had been applied before the accident occurred. The engineer and the fireman were killed in the accident, and it could not be determined why the train was not operated in accordance with the authority which required that it be stopped short of the block-limit signal at DF and not proceed until permission was received to enter the next block.

As Extra 9519 North was approaching the point where the accident occurred the engineer and the fireman were in the central compartment at the front of the locomotive. The members of the train crew were in the caboose. The brakes of this equipment had been tested and had functioned properly when used en route. The trainphone apparatus had functioned properly and was last used in the vicinity of Cresson Yard as the train approached EP. Surviving members of the crew estimated that the speed of their train was approximately 20 to 25 miles per hour. The fireman said that he first saw the locomotive of the opposing train at a distance of approximately 350 to 400 feet. He immediately called a warning and jumped off the locomotive. He did not know whether the engineer made an application of the brakes before the collision occurred. The conductor said that he glanced out the side window of the caboose and saw the lights of the locomotive of the opposing train as it moved on the curve in which the accident occurred. He said that he attempted to open the conductor's valve, but he did not know whether the brakes were applied or whether there was an exhaust from the valve.

Examination of the equipment after the accident occurred disclosed that on the locomotive of Extra 5811 South the automatic brake valve was in running position, the independent

brake valve was in release position, and the throttle was in idle position. On the locomotive of Extra 9519 North the retard valve was in passenger position. The throttle was in idle position. The handles of the automatic brake valve and the independent brake valve were broken and their positions at the time of the accident could not be determined. According to the tapes of the speed-recording devices the speed of Extra 5811 South varied between 20 and 25 miles per hour throughout a distance of 3 miles immediately north of the point of accident, and it was about 26 miles per hour at that point. The speed-recording device of the first Diesel-electric unit of the locomotive of Extra 9519 North was destroyed in the accident. The tape of the rear unit indicates this train was moving about 31 miles per hour at the time the collision occurred. Apparently there was no appreciable reduction in the speed of either train before the accident occurred. In observations made after the accident it was found that the view between opposing movements approaching the point of accident is 2,012 feet. This view is restricted at points within this distance by embankments and vegetation adjacent to the track.

On this line train movements are authorized by the train dispatcher. In authorizing a movement, he instructs the signalman at EP to direct the crew of a train to proceed at one or more designated block or block-limit stations. The signalman then displays the proper block-signal aspect or issues the proper block authority for the train at these stations. In the instant case the dispatcher instructed the signalman to direct Extra 5811 South to proceed at WC, BI, and IR block-limit stations. The signalman then issued the clearance card Form K to the conductor directing the train to proceed at these stations as though clear-block signal was displayed. The dispatcher later instructed the signalman to direct Extra 9519 North to proceed at EP block station and KY block-limit station, and the signalman arranged the proper block authority. Under the rules, neither train was then permitted to pass DF block-limit station until the engineer or conductor received further authority. The signalman on duty at EP when Extra 5811 South departed from Barnesboro said that he did not communicate with any member of the crew of that train after he issued the clearance card Form K to the conductor at 6:19 a. m. This signalman was relieved by the first-trick signalman at 6:56 a. m. The first-trick signalman said that he did not communicate with any member of the crew of Extra 5811 South before the accident occurred. Both signalmen said that the train-phone apparatus functioned properly during their respective tours of duty.

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In this territory the block-limit stations are unattended and the block-limit signals display the same aspects whether the blocks are occupied or unoccupied. The signalman in charge of a block-limit station may give a train verbal permission to enter one block, and this permission may be obtained by either the conductor or the engineer. The rules provide that the conductor and the engineer are equally responsible for the safety of a train. However, under this method of operation it is customary for either the conductor or the engineer to secure block authority, and the conductor and other members of the crew at times have no knowledge of the authority under which the train is moving when this authority is secured by the engineer. In the instant case the conductor of Extra 5811 South was on the locomotive as the train passed DF, but neither he nor the front brakeman proceeded to the front control compartment to ascertain whether additional block authority had been obtained. The conductor said that it had been customary to rely upon the engineer to arrange for block authority when he, the conductor, was not in communication with the signalman, and when the train passed DF he assumed that proper block authority had been arranged. In operation by train order, both the engineer and the conductor, and, when practicable, all other members of a crew are required to know what authority has been conferred and what restrictions have been placed on the movement of their train. A greater degree of safety would be obtained on the line on which this accident occurred if both the engineer and the conductor, and, when practicable, other members of a crew were similarly required to be informed as to the authority under which their train was moving.

Cause

This accident was caused by a train occupying a block without authority.

Dated at Washington, D. C., this seventeenth day of February, 1956.

By the Commission, Commissioner Clarke.

(SEAL)

HAROLD D. MCCOY,
Secretary.