INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

PITTSBURGH & WEST VIRGINIA RAILWAY

WEST BELT JUNCTION, PA.

NOVEMBER 19, 1936

INVESTIGATION NO. 2118

SUMMARY

Railroad:	Pittsburgh & West Virginia		
Date:	November 19, 1936		
Location:	West Belt Junction, Pa.		
Kind of accident:	Head-end collision		
Trains involved:	Freight	:	Freight
Train numbers:	First No. 90	:	Extra 912
Engine numbers:	1102	:	912
Consist:	30 cars and Caboose	:	17 cars and caboose
Speed:	4-5 m. p. h.	:	8-12 m. p. h.
Track:	$3^{\circ}54'$ curve; 0.84 percent descending grade for east-bound trains		
Weather:	Clear		
Time:	11:40 p. m.		
Casualties:	1 killed and 3 injured		
Cause:	Improper display of proceed signal indication, due to changes in signal control circuits which had been made by a signal maintainer		

January 8, 1937

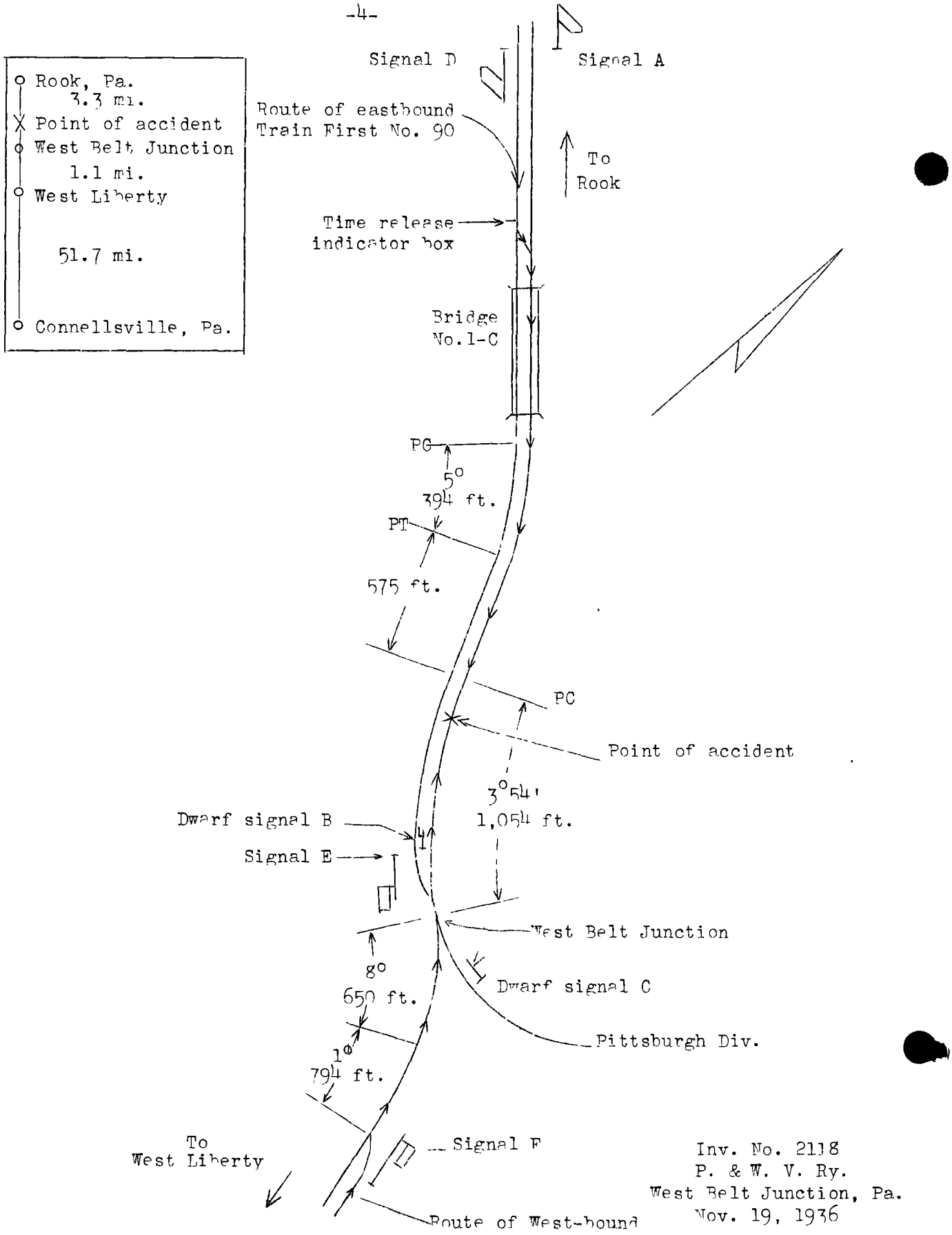
To the Commission:

On November 19, 1936, there was a head-end collision between two freight trains on the Pittsburgh & West Virginia Railway near West Belt Junction, Pa., which resulted in the death of 1 employee and the injury of 3 employees.

Location and method of operation

This accident occurred on the Connellsville Division, which extends between Connellsville and Rook, Pa., a distance of 56.1 miles. The territory between Rook and West Liberty, located 4.4 miles east of Rook, within which the accident occurred, is inside of yard limits; there are no scheduled trains between these points, and movements are governed by yard rules and an automatic block-signal system. Double track extends eastward from Rook to West Belt Junction, a distance of 3.3 miles; this is followed by 1,493 feet of single track and then there is a section of double track about 1 mile in length which extends a short distance east of West Liberty. The accident occurred on the west-bound track of the first-mentioned section of double track, at a point 883 feet west of West Belt Junction; approaching this point from the west, the track is tangent for a distance of 1,890 feet, followed by a 5° curve to the right 394 feet in length, tangent track for a distance of 575 feet, and then a 3°54' curve to the left 1,054 feet in length, the accident occurring on this last-mentioned curve at a point 171 feet from its western end. Approaching from the east, there is a compound curve to the left, the curvature being 1° for 794 feet and 8° for a distance of 650 feet, followed by the curve to the right on which the accident occurred. The grade for east-bound trains varies from 0.82 to 1 percent descending, being 0.84 percent at the point of accident. The track approaching the point of accident from either direction passes through precipitous rock cuts, and on account of the height of these cuts and growing brush, the view to be had by the crews of approaching trains is materially restricted.

Bridge 1-C, 635 feet in length and located 1,140 feet west of the point of accident, is so constructed that only the west-bound track is adequate for engines of the 1102 type, the type involved in this accident, and on this account a facing-point cross-over connecting the two main tracks is located immediately west of the bridge for the purpose of diverting east-bound engines of this class against the current of traffic as far as the end of double track; the switch on the west-bound track is a spring switch, normally lined for the current of traffic. The switch on the east-bound track is a hand-throw switch, electrically locked and equipped with a time release; the normal position of this switch also is for the current of



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traffic and a switch tender is assigned to operate the switch whenever the cross-over is to be used.

In order to obtain a release of the facing-point switch, the switch tender turns a knob in the indicator box and the arrangement is such that at the end of 4 seconds the circuit controlling west-bound signal F is broken, thereby causing that signal to assume the stop position, and at the end of 1 minute 40 seconds, if the west-bound track west of signal F is unoccupied, a white light appears at the indicator box and the switch may be operated so as to permit the movement of an east-bound train through the cross-over against the current of traffic; if the white light does not appear in the indicator box, the time release has not functioned to unlock the switch and the switch cannot be thrown. West-bound automatic block signal F, the signal primarily involved in this accident, is a 2-position, lower-quadrant, semaphore signal, located at the eastern end of the single track, 2,532 feet east of the point of accident and 4,307 feet east of the cross-over; it displays green or red for night indications and governs movements to west-bound automatic signal A, located 770 feet west of the cross-over.

The weather was clear at the time of the accident, which occurred about 11:40 p. m.

Description

Train First No. 90, an east-bound freight train, consisted of 30 cars and a caboose, hauled by engine 1102, and was in charge of Conductor Parker and Engineman McMurray. This train does not assume its schedule rights until arriving at West Liberty, the initial station on its schedule. It departed from Rook, on the eastward track, at 11:32 p. m., according to the train sheet, crossed to the westward track, without stopping at the cross-over west of Bridge 1-C, and collided with Extra 912 while traveling at a speed estimated to have been 4 or 5 miles per hour.

Extra 912, a west-bound freight train, consisted of 17 cars and a caboose, hauled by engine 912, and was in charge of Conductor McCready and Engineman McFeatters. The running order of this train was fulfilled at West Liberty and the train entered yard limits and passed West Liberty on the west-bound track at 11:32 p. m., according to the train sheet, stopping at the end of the double track because signal F was displaying a stop indication on account of a preceding train in the block between signals F and A. The signal cleared within 2 or 3 minutes and the train then proceeded out on the single track, entered the west-bound track at West Belt Junction, and collided with

Train First No. 90 while traveling at a speed estimated to have been from 8 to 12 miles per hour.

Neither of the engines was derailed, but the engine truck of engine 912 was driven back under the front of the boiler and the head end of the tender was raised and driven forward about 30 inches, partly crushing the engine cab; the second car in this train was broken in two. The employee killed was the engineman of Extra 912, and those injured were the fireman and head brakeman of Extra 912 and the conductor of Train First No. 90.

Summary of evidence

Engineman McMurray, of Train First No. 90, stated that he received a yellow indication at east-bound signal D, located 770 feet west of the cross-over; this being the most favorable indication given by that signal, and he proceeded through the cross-over at a speed of about 8 miles per hour, upon receiving a hand signal from the switch tender. On emerging from the east end of a cut located beyond the bridge, he saw the reflection of a headlight, the fireman and brakeman seeing it about the same time. He applied the air brakes in emergency and said he thought his train was going to stop before the collision occurred; he did not leave the engine and he estimated the speed to have been not more than 4 or 5 miles per hour at the time of the accident. After the collision he heard the exhaust from engine 912 and saw fire flying from the wheels, which indicated to him that steam was still being used and that the brakes on the engine were not applied. Afterward he talked with Engineman McFeatters, who said he thought the opposing train was on the other track; the brakeman and fireman of Extra 912 told Engineman McMurray that signal F displayed a proceed indication for their train.

Fireman Tischler, of Train First No. 90, stated that after proceeding through the cross-over the speed was increased to about 15 miles per hour. He was on his seatbox looking ahead for dwarf signal B, near the end of double track, but the engineman saw the reflection of the headlight before he saw it. Fireman Tischler jumped off on the engineman's side, and from the reduction in speed he thought that the train would be stopped before the collision. Head Brakeman Graf, of Train First No. 90, added no information of importance.

Fireman Evans, of Extra 912, stated that a red indication was displayed as his train approached signal F, the train being stopped with the engine about 7 or 8 car lengths east of the signal. After waiting about 2 or 3 minutes he heard either the engineman or the brakeman say that the signal had changed

and looked out and saw that the indication was green. He was in the gangway on the right side and watched the signal as they started moving and it was still displaying a green indication as the front end of the engine passed it; Fireman Evans also stated that the engineman was looking ahead out of the side window, which was open. The speed of his train as they proceeded on the single track was about 10 miles per hour, and the first he knew of the opposing train was when the brakeman called a warning and he said he jumped off just as the collision occurred.

Head Brakeman Wright, of Extra 912, stated that he was on the front seatbox on the left side of the cab when he observed the red indication of signal F and after waiting about 2 or 3 minutes the engineman called out that they had a green block. He looked out, saw the green indication, and said the train proceeded at a speed of between 10 and 15 miles per hour. He first saw the reflection of the opposing headlight when it was about 12 or 13 car lengths distant, at which time the speed of his own train was 10 or 12 miles per hour, and when the opposing train was about 6 or 7 car lengths distant he saw that it was on the same track and jumped off the engine. He thought the engineman was still using steam when he got off, and was unable to say whether or not the engineman applied the brakes. After the accident the engineman told him that he thought the opposing train was on the east-bound track.

Switch Tender Sullivan, who operated the cross-over switch, stated that after receiving telephone information from the yardmaster at Rook that Train First No. 90 was approaching; he went to the indicator box and when the caboose of Extra 914, the west-bound train which was ahead of Extra 912, had passed his shanty he operated the time release but the white light did not appear because Extra 914 had not yet cleared the block. He then turned the knob a second time and as he did so he saw that the caboose of Extra 914 had cleared. When the time release had run down the white light appeared and he then saw the headlight of Train First No. 90. He threw the cross-over switch for a movement to the west-bound track and gave a proceed signal, the train passing him at a low rate of speed. Switch Tender Sullivan stated that he had been assigned to operate this cross-over switch since September 21, 1935, and had never been able to unlock the switch when the block was occupied.

On November 21 the Commission's inspectors made an examination of the signals and track and on November 24 inspection and tests were made under various operating conditions and observations were made of train movements. On checking the time-release mechanism it was found that the circuit controlling signal F opened in 4 seconds after the time release commenced

to function, and that the unlocking operation was completed in 1 minute and 40 seconds, at which time the electric lock became energized so as to unlock the switch lever and the lamp in the indicator box lighted up. Further tests were conducted on November 27, but nothing wrong was noted. On the night of November 27, however, Signal Maintainer Root made a statement to the effect that on or about June 15 he had bridged the FH circuit at the time-release contacts by putting the FH5 and FH4 wires on the same binding post; the effect of this change by Signal Maintainer Root was to extend the time limit for opening this circuit from 4 seconds to 1 minute 40 seconds, and he said that on November 22 he restored these wires to their positions as originally installed. Subsequently tests were made with the circuit changed as stated by Signal Maintainer Root, and it was demonstrated that under this condition the circuit which controls signal F was not broken until the expiration of the run-down period of 1 minute and 40 seconds; under these conditions, with the tracks unoccupied between signals F and A, and also between signals F and D, and the cross-over in normal position, signal F would display a proceed indication and an approaching west-bound train could pass it in proceed position just as an unlock was obtained.

The investigation also developed information concerning other instances where opposing trains had entered the block section here involved under proceed signal indications. On March 17, while an engine and four cars were moving eastward on the west-bound track, the indication of signal F changed from stop to proceed and a west-bound train which had been standing at the signal proceeded into the block already occupied by the opposing train; the crews, however, saw each other in time to stop. Investigation at that time disclosed that on the night in question, while clearing a slide which had occurred in the vicinity, trackmen had gotten mud and dirt on the rails of the west-bound track, and while the east-bound engine and four cars were proceeding over the muddy rails at this particular point the track circuit was not shunted, thus allowing signal F to go to the proceed position.

On May 20, 1936, there was another case of opposing trains on the same track; this movement involved dwarf signal C, located on the Pittsburgh Division 272 feet east of the end of the double track at West Belt Junction. The engineman of a west-bound train stated that he received a yellow or proceed indication at this signal. In the meantime, however, an east-bound train passed signal D, whereupon the switch tender operated the time release, obtained an unlock, and threw the cross-over switch, the train proceeding upon the west-bound track; however, each of these crews also saw the opposing train in time to stop. After this occurrence Signal Maintainer Root checked the installation

against the original installation plan, finding nothing to indicate that the installation was not as shown by the plan, and then made a change in the circuit so as to provide that when signal C displayed a proceed indication, an unlock for the cross-over could not be obtained. This change, made in June, apparently did not effect the desired results, and following the occurrence of the accident here under investigation he removed the lock circuit control from signal C and broke it through the circuit controller operated in connection with the Pittsburgh Division switch.

Discussion

The evidence in this investigation disclosed that when Extra 912 arrived at signal F the block was occupied by a preceding west-bound train; Extra 914, and that when the latter train cleared the block, signal F displayed a proceed indication; Extra 912 thereupon proceeded and entered the west-bound track at West Belt Junction. In the meantime, however, the switch tender at the cross-over west of bridge 1-C had attempted to operate the time release, but as Extra 914 had not cleared the block he did not obtain an unlock for the cross-over switch; after the caboose of Extra 914 had cleared the block he made another attempt, and this time he obtained the release and threw the switch. Train First No. 90, then approaching, proceeded through the cross-over and upon the west-bound track. With the limited view had by the crew of that train, Extra 912 was not seen in time to avert the accident; the crew of Extra 912 saw the reflection of the headlight of the opposing train but thought it was on the east-bound track and no action was taken by the engineman at that time to stop his train. Signal Maintainer Root had made a change in the circuits controlling signal F so that when operating the time release, the control circuit of signal F remained closed for a period of 1 minute 40 seconds instead of only 4 seconds as intended, thereby eliminating the intended protection and causing a condition whereby a release could be obtained at the cross-over at the time a west-bound train was passing signal F and before that signal assumed stop position. This is apparently what happened in this case and neither of the trains involved received any signal indicating the approach of the opposing train.

There had been two previous occasions where opposing trains had entered this block under proceed signal indications, but no accidents resulted, and Signal Maintainer Root made a change in the unlock circuit so that an unlock could not be obtained when signal C displayed a proceed indication. He stated that he made these changes upon the assumption that a greater degree of protection would be afforded, however, the change made relative to the time release and signal F, eliminated the

intended protection and the change made relative to signal C did not effect the desired results, as that change was revised subsequent to this accident.

Conclusions

This accident was caused by a proceed signal indication being improperly displayed, due to changes in the signal-control circuits which had been made by a signal maintainer.

Recommendation

It is recommended that a thorough check be made of the present signal installation on this line and instructions be issued to insure that proper and adequate protection is afforded.

Respectfully submitted,

W. J. PATTERSON,

Director.