

BUREAU OF SAFETY

REPORT NO. 1389

Railroad: Chicago, Rock Island & Pacific and
Minneapolis & St. Louis

Date: June 13, 1935

Location: Morning Sun, Iowa

Kind of accident: Side collision at intersection of two roads

Trains involved: Freight (M&StL) : Passenger (CRI&P)

Train numbers: No. 95 : No. 63

Engine numbers: 475 & 627 : 833

Consist: 44 cars and caboose : engine and 4 cars

Speed: 12-25 m.p.h. : 20-50 m.p.h.

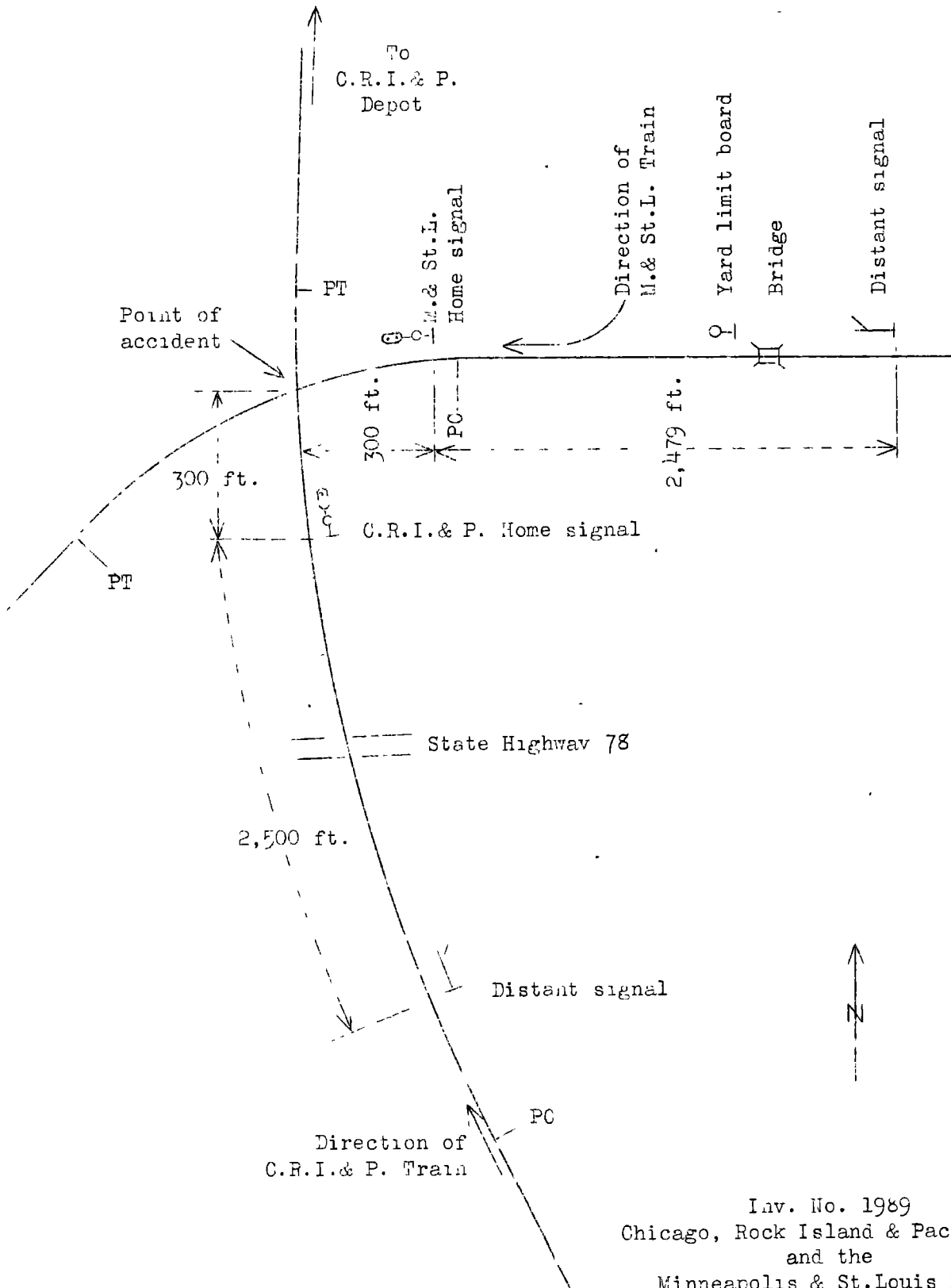
Track: Both tracks curved at intersection

Weather: Clear

Time: 6:45 a. m.

Casualties: 1 killed; 12 injured

Cause: It is believed passenger engineman failed properly to observe and obey stop indication of home signal governing movement of his train over crossing.



Inv. No. 1989
Chicago, Rock Island & Pacific Ry.
and the
Minneapolis & St. Louis RR.
Morning Sun, Iowa
June 13, 1935

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT WHICH OCCURRED AT THE INTERSECTION OF THE TRACKS OF THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY AND THE MINNEAPOLIS & ST. LOUIS RAILROAD AT MORNING SUN, IOWA, ON JUNE 13, 1935.

August 7, 1935.

To the Commission:

On June 13, 1935, there was a side collision between a passenger train of the Chicago, Rock Island & Pacific Railway and a freight train of the Minneapolis & St. Louis Railroad at Morning Sun, Iowa, which resulted in the death of 1 employee, and the injury of 8 passengers, 3 employees and 1 news agent. This accident was investigated in conjunction with the Iowa Board of Railroad Commissioners.

Location and method of operation

This accident occurred at the intersection of the tracks of Subdivision 15 of the Cedar Rapids-Dakota Division of the Chicago, Rock Island & Pacific Railway, hereinafter referred to as the CRI&P, extending between Burlington and Cedar Rapids, Iowa, a distance of 98.1 miles, and the Third District of the Eastern Division of the Minneapolis & St. Louis Railroad, hereinafter referred to as the M&StL, extending between Monmouth, Ill., and Oskaloosa, Iowa, a distance of 122.4 miles. Each railroad is a single-track line over which trains are operated by timetable and train orders, no block-signal system being in use. Timetable directions on both lines are east and west, but at the intersection the CRI&P track extends north and south by compass direction, while the M&StL track extends east and west. These tracks cross at an angle of $81^{\circ}58'$ at a point 1,450 feet south of the CRI&P depot, and within M&StL yard limits, 1,852 feet west of the east yard limit board. Approaching the crossing from the south on the CRI&P there is a $0^{\circ}40'$ curve to the right 4,020 feet in length, the crossing being located on this curve at a point 720 feet from its northern end, the grade for west-bound CRI&P trains being 0.14 percent descending from a distance of 1,000 feet south of the crossing. Approaching the crossing from the east on the M&StL the track is tangent for a distance of 1,000 feet, followed by a 2° curve to the left 1,196 feet in length,

the crossing; being located on this curve at a point about 375 feet from its eastern end, the grade for west-bound M&StL trains being ascending from a distance of about 2,000 feet east of the crossing, varying from 0.2 to 1.0 percent and being 0.4 percent over the crossing and for a distance of about 900 feet beyond.

The crossing is protected by an automatic electric interlocking plant, consisting of signals without derails; the distant signals, of the semaphore type, are inoperative and fixed in caution position, while the electric home signals are of the color-light type, approach-lighted, the indications being red for stop, and green for proceed; a marker light giving a red indication is also located on the mast of each home signal, $5\frac{1}{2}$ feet below the two governing top lights. The home signal on each road is located 300 feet from the crossing; the CRI&P distant signal is located 2,500 feet south of its home signal, and the M&StL distant signal is located 2,479 feet east of its home signal. The automatic interlocking is so arranged that when an approaching train on either road passes its respective distant signal, provided there are no conflicting train movements and the interlocking block is unoccupied, a proceed indication is automatically displayed on its home signal for the movement of the train over the crossing, while a stop indication is automatically displayed by the home signal of the other road when an approaching train passes the distant signal; the home signal which displays a proceed indication for an approaching train retains that indication until the engine passes it, unless a train on the other line overruns its home signal, while the stop indication of the home signal on the other road continues to be displayed until the rear end of the first train passes the opposing home signal on its own line. The speed of all trains over the crossing is limited to 20 miles per hour.

When a north-bound CRI&P train reaches a point 3,890 feet south of the crossing the engineman can then see the M&StL track for a distance of 2,300 feet east of the crossing, while on reaching a point 1,344 feet south of the crossing he can see the M&StL track as far as the distant signal location, this view varying somewhat depending upon the location; however, from a point 1,600 feet south of the crossing an unobstructed view of the M&StL track can be had for a distance of 900 feet, and vice versa from the fireman's side of the cab of a west-bound M&StL train.

The weather was clear at the time of the accident, which occurred about 6:45 a. m.

Description

M&StL Train No. 95, a west-bound freight train, consisted of 44 cars and a caboose, hauled by engines 475 and 627, and was in charge of Conductor Ross and Enginemen Loe and Helm. This train left Monmouth yard, 42.1 miles east of Morning Sun, at 4:55 a. m., according to the train sheet, made two stops en route, one of which was for a railroad crossing, passed the distant signal which was displaying a caution indication, passed the east yard limit board at Morning Sun, passed the home signal, and while traveling at a speed estimated to have been between 12 and 25 miles per hour it struck about the middle of the right side of the second car of CRI&P Train No. 63 on the crossing.

CRI&P Train No. 63, a west-bound passenger train moving northward over the crossing, consisted of 1 combination mail and baggage car, 2 baggage cars and 1 coach, all of steel construction, hauled by engine 833, and was in charge of Conductor Stonebraker and Engineman Herman. This train left Mediapolis, the last open office, and 7.6 miles from Morning Sun, at 6:35 a. m., according to the train sheet, five minutes late, passed the distant signal which was displaying a caution indication, passed the home signal, and while moving over the crossing at a speed variously estimated to have been from 20 to 50 miles per hour it was struck by M&StL Train No. 95.

CRI&P engine 833, its tender and the first car were not derailed; both baggage cars were destroyed, while the coach was only slightly damaged. M&StL engines 475 and 627, together with their tenders and the first 4 freight cars, were derailed and scattered across the tracks and crossing. The automatic electric interlocking plant was badly damaged and it had not been restored to service at the time of the investigation. The employee killed was a baggageman of CRI&P Train No. 63, while the employees injured were the conductor, brakeman and another baggageman of that train.

Summary of evidence

Enginemen Loe, of the lead engine of M&StL Train No. 95, stated that the air brakes on his train had been tested and worked properly en route. When more than a mile from the crossing at Morning Sun the speed of his train was about 25 miles per hour; he closed the throttle to the extent that only enough steam was used to cushion the engine, permitting the train to drift; he did not make any air brake application, or open the throttle again. The distant signal was displaying a caution indication and he passed that signal at a speed of 20 or 22 miles per hour; the home signal immediately lighted and

displayed a proceed indication, and he acknowledged the indication by sounding two short blasts on the engine whistle; Fireman Turner also called the indication. He continued to watch this signal and it remained green until his engine passed it. When about half way between the distant and home signals, on the ascending grade, the fireman told him that a CRI&P train was approaching and he remarked to the fireman that their train had beaten the CRI&P train this time, meaning that their train was the first to enter upon the track circuit controlling the automatic interlocking home signals and had therefore obtained an indication to proceed over the crossing, and he supposed that the CRI&P train would stop accordingly. Nothing further was said until the lead engine reached or passed the home signal, at which time the speed was about 14 or 15 miles per hour, and then the fireman shouted to him that the CRI&P train was not going to stop, whereupon the engineman immediately applied the air brakes in emergency, when about 100 feet from the crossing, and jumped from the fireman's side when about 40 feet from the crossing, estimating the speed at the time of the accident to have been about the same, 14 or 15 miles per hour. Engineman Loe did not see the CRI&P train at any time prior to the accident, as it approached from the fireman's side.

Fireman Turner, of the lead engine of M&StL Train No. 95, was on his seat box approaching Morning Sun and after passing the distant signal, which was displaying a caution indication, he saw the proceed indication of the home signal and called it to the engineman, who acknowledged it by sounding two blasts of the whistle. After passing over a small trestle at the foot of the ascending grade, the trestle being located about 700 feet west of the M&StL distant signal, he looked toward the south and saw the CRI&P train approaching but still some distance south of the CRI&P distant signal, and at that time he thought the CRI&P train would stop for the crossing. As his train approached the home signal at a speed of about 15 or 16 miles per hour, Fireman Turner looked across and the CRI&P passenger train was then somewhere between the CRI&P home signal and a State highway located 981 feet south of the CRI&P home signal; the passenger train was traveling at such a rate of speed that he thought it could not get stopped for the crossing; he called a warning of danger to the engineman and jumped just before the CRI&P train started over the crossing directly in front of his own train and was struck, at which time he estimated the speed of his train to have been about 12 miles per hour. Fireman Turner said that he

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called the warning of danger about the time the lead engine of his train passed the home signal and that at that time the CRI&P train was north of the State highway and about 3 or 4 car length from the CRI&P home signal, traveling at a speed of about 50 miles per hour.

Head Brakeman Frogner, of M&StL Train No. 95, stated that he was riding on the brakeman's seat box of the lead engine ahead of the fireman; as the train passed the distant signal at a speed of about 25 miles per hour the light flashed green on the home signal and the fireman called "clear board" and the engineman sounded the whistle. When in the vicinity of the small trestle at the foot of the ascending grade involved the fireman said that a CRI&P passenger train was coming; the brakeman looked ahead and made certain that the M&StL home signal was clear. The freight train was drifting with the speed gradually decreasing; on reaching a point about 15 to 18 car lengths from the crossing the brakeman saw the CRI&P train between the CRI&P distant signal and the State highway, and when close to the M&StL home signal, at which time the speed of his own train was about 15 to 17 miles per hour, he again saw the CRI&P train, about 4 or 5 car lengths from the CRI&P home signal and traveling at a speed which he estimated to have been between 40 and 50 miles per hour; he then realized that an accident was imminent. At the time of the accident he estimated the speed of his own train to have been about 12 to 15 miles per hour.

Engineman Helm, of the second engine of M&StL Train No. 95, stated that the brake valve on his engine was cut out and the air brakes were under the control of the lead engineman. He worked steam on the second engine until the distant signal was reached, at which time the speed was about 25 miles per hour, and from that point on he used a drifting throttle. The M&StL home signal displayed a proceed indication; he saw the green light when it went on, and he was unaware of anything wrong until the freight train was passing the home signal, when Fireman Wells told him that the CRI&P passenger train was not going to stop for the crossing; the engineman quickly crossed over to the left side of the cab and for the first time he actually saw the CRI&P train, when it was passing its own home signal and traveling at a speed of about 40 miles per hour; he then went back to his own side and started to apply the independent engine brake and about the same time the air brakes were applied in emergency from the lead engine; he jumped just prior to the accident, at which time he estimated the speed of his train to have been about 15 to 18 miles per hour.

Fireman Wells, of the second engine of M&StL Train No. 95, stated that he was sitting on his seat box and the speed was about 20 miles per hour on passing the distant signal, following which he glanced to the left and saw the CRI&P train south of the CRI&P distant signal, and then he got down to put in a fire. He did not see the indication of the M&StL home signal, but his engineman called it as clear. When the second engine was about three car lengths from the M&StL home signal, he again saw the CRI&P train and realized it was traveling too fast to stop for the crossing; he estimated its speed at about 45 miles per hour, and it had almost reached the CRI&P home signal; he immediately called a warning of danger to his engineman and jumped, at which time he estimated the speed of his own train to have been about 15 miles per hour.

Conductor Ross and Flagman Mitchell, of M&StL Train No. 95, were in the cupola of the caboose and were not aware of anything wrong prior to the accident; they both said that they saw the M&StL home signal displaying a proceed indication after the lead engine passed the distant signal. Conductor Ross estimated the speed to have been about 25 miles per hour approaching Morning Sun and about 16 or 17 miles per hour after passing the distant signal; he did not see the CRI&P train before the accident. Flagman Mitchell estimated the speed to have been about 15 miles per hour after passing the M&StL distant signal.

Engineman Herman, of CRI&P Train No. 63, stated that he had been in the service of this railroad for over 25 years; this was not his regular run but he had had this run intermittently for about 15 years. On the morning of the accident, when approaching Morning Sun the distant signal governing his train was displaying a caution indication and he said he reduced speed to 20 miles per hour as required. He said that the top light of the CRI&P home signal went green and the bottom light showed red; he called the indication and sounded two short blasts on the whistle, and the fireman repeated. Immediately after passing the distant signal he looked across and saw the M&StL freight train, but he could not say just where that train was then as it would be hard for him to judge the distance owing to track curvature; however he did not think the M&StL train was as close to the crossing as his own train. Approaching the State Highway he sounded the crossing whistle signal; he did not continue to watch the M&StL train as he was looking at the CRI&P home signal, which he passed at a speed of about 20 miles per hour. He paid no more attention to the M&StL train until his own engine reached the crossing, depending entirely upon the signal indication and expecting the M&StL train to stop for the crossing. It did not occur to him that anything was going to happen until he got to the crossing, and then he got a good view of the

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M&StL train, which he said was traveling about 25 miles per hour and the lead engine was just about passing the M&StL home signal; he immediately opened the throttle wide and worked steam in an endeavor to get over the crossing in time to avert an accident. He estimated the speed of his own train to have been increased about 1 or 2 miles per hour after he opened the throttle wide, and said it was about 21 or 22 miles per hour when his train was struck. Engineman Herman said that the CRI&P home signal was green from the time his train entered upon the circuit until he passed it. On further questioning concerning this signal indication he drew a sketch illustrating the light indications on the CRI&P home signal and said the top light was green, the second one red, and no indication was shown on the bottom or marker light. Engineman Herman said that whenever his train first enters upon the track circuit the red light is displayed first but the indication quickly changes to green. When he first saw the M&StL train the engines were working steam and it looked like they were coming out of a dip at the bottom of the sag just before his own train reached the CRI&P distant signal; however, he figured that the M&StL train was far enough away so that it would not bother him.

Fireman DeFore, of CRI&P Train No. 63, stated that approaching Morning Sun he was on the seat box; his train passed the CRI&P distant signal at a speed of about 25 or 35 miles per hour, and approached the home signal at 18 or 20 miles per hour. Shortly after passing the distant signal the engineman called the indication of the home signal as green, and he answered him, but he did not actually see the indication displayed until the front end of the engine was about 5 or 6 car lengths from the home signal, at which time he leaned out of the left cab window on the outside of the curve and saw that the top light was green and there was a red light under it. Fireman DeFore said that the engineman did not say anything about the M&StL train, and he was not aware of the approach of that train until his own engine was passing over the crossing, at which time he said that the other train had not then passed the M&StL home signal, and then the accident occurred. Fireman DeFore also made a sketch of the CRI&P home signal and when asked to illustrate it as it appeared to him on the morning of the accident he marked it to show that the top light was green and the second light red, while he did not show any bottom light.

Conductor Stonebraker and Brakenan Peck, of CRI&P Train No. 63, were in the last car and they were not aware of anything wrong prior to the accident, at which time they estimated the speed of their train to have been about 20 miles per hour. They did not see the indication displayed by the CRI&P home signal or the approaching M&StL train.

Signal Maintainer Shallabarger, of the CRI&P, stated that he had charge of and maintained the automatic interlocking plant at Morning Sun for both railroads; on May 19, 1935, he made a general inspection of the plant and on May 28, 1935, he inspected the lights, on both of which occasions he found everything to be in proper condition. He was at Morning Sun on his way from the hotel to make a regular inspection of the plant when the accident happened and he reached the crossing a few minutes later; the instrument case which was located about 15 feet from the tracks in the northwest intersection of the crossing was demolished and the batteries and relays housed in the case were destroyed, due to the accident; therefore the signal lights involved were extinguished. He then made a test of the home signals, using dry cells, and found the lights in good condition and the lenses of the proper colors. No report of any false clear signal indication at this plant had ever been received and to his knowledge there had been no failures of any kind; there was nothing to indicate that the plant had failed to function as intended. He could see no possible way for a green light and red light to be displayed close together on the home signal, as stated by the engineman and fireman of the CRI&P train; the marker light is located on the mast a considerable distance below the head containing the two upper lights; the marker light should show a red indication from the time an approaching train enters upon the track circuit regardless of the indication displayed by the light above in the head.

Subsequently the undamaged signal apparatus involved at the automatic interlocking plant was tested by the Assistant Signal Engineer Duffy, Signal Supervisor Kinney, Signal Draftsman Bartholomew, Signal Foreman Schmitt and Signal Maintainer Shallabarger, of the CRI&P, and Signal Supervisor Stanley, of the M&StL, and a representative of the State Board of Railroad Commissioners. These tests developed that the operating characteristics of the relays were well within prescribed limits; the light circuit to the green CRI&P home signal involved was free from crosses or grounds, and showed no current passing from these wires to the ground or other wires, and everything indicated that the apparatus functioned as intended. Mr. Bartholomew stated no report had ever been made of any false clear signal indication on the CRI&P in a plant of this type.

Various residents of the vicinity, not employees by either railroad involved, including farmers, an electrician, a day laborer and a school boy, who saw the trains involved as they approached, made statements to the effect that the M&StL freight train approached the crossing and entered the block first, traveling at a speed estimated to have been between 12 and 20 miles per hour, and that the CRI&P passenger train then approached traveling at a speed estimated to have been between 40 and 45

miles per hour, or about twice as fast as the M&StL train.

Discussion

At the crossing where this accident occurred the signals which govern train movements are controlled by electric circuits operated automatically by approaching trains and so arranged that a proceed signal is displayed for the train which first enters upon the controlling track circuits. As designed, proceed signals cannot be displayed at the same time for two conflicting movements. However, the two trains involved in this accident approached the crossing at the same time, and the engineman of each train stated that a proceed signal was displayed for his train; both trains were operated accordingly until it was observed that a collision was imminent when the M&StL engineman attempted to stop just before reaching the crossing, and the CRI&P engineman attempted to increase speed so as to clear the crossing, for the purpose of avoiding the collision.

The evidence clearly shows that under the conditions which existed just prior to the accident a proceed signal indication should have been displayed for the M&StL train and a stop signal indication should have been displayed for the CRI&P train. The controlling track circuits extend to the distant signals on both roads which are located practically equal distances from the crossing; the CRI&P passenger train was moving down a 0.14 percent grade from a distance of 1,000 feet south of the crossing, while the M&StL freight train was moving within yard limits and up a grade varying from 0.2 to 1.0 percent from a distance of 2,000 feet east of the crossing; the testimony of several residents of Morning Sun who were eye-witnesses of the accident was to the effect that the speed of the M&StL train was from 12 to 20 miles per hour, while the speed of the CRI&P passenger train was about 40 or 45 miles per hour approaching the crossing, or about twice as fast as that of the M&StL freight train, and that the M&StL freight train entered the block first. According to the record the CRI&P train covered the distance from Mediapoli to the crossing, 7.3 miles, in 10 minutes, or at an average speed of 43.8 miles per hour, while the M&StL train covered the distance from Monmouth to the crossing, 41.6 miles, in 1 hour and 50 minutes, or at an average speed of 22.7 miles per hour. Furthermore, Engineman Herman of the CRI&P train said that his train had not yet reached the CRI&P distant signal when he first saw the M&StL freight train and that it looked as though that train was then coming out of a dip; the dip in the M&StL track is located about 500 feet west of the M&StL distant signal, and

therefore, according to this statement also the M&StL freight train was the first train to enter the limits of the automatic electric interlocking plant. The foregoing corroborates evidence given by six members of the M&StL train crew, all of whom stated that the home signal governing movement of their train over the crossing displayed a clear indication.

While Engineman Herman and Fireman DeFore, of the CRI&P train, both stated that the CRI&P home signal displayed a proceed indication for their train, there was no other evidence to that effect; the engineman said that the light went to green when his train passed the distant signal and he called the indication which the fireman acknowledged although the fireman said he did not see the signal until the front end of the engine was only a short distance from it.

The destruction of some of the signal apparatus as a result of the collision made it impossible to reestablish the operation of the plant at the time of the accident, and therefore a positive conclusion cannot be reached; however, the test of the undamaged apparatus disclosed that it was in proper operating condition, and this fact together with the fact that the M&StL home signal cleared properly for the approaching train and the record of proper operation of the plant since its installation supports the opinion that the CRI&P home signal was displaying a stop indication which was not properly observed or obeyed.

Conclusion

It is believed that this accident was caused by failure of Engineman Herman of CRI&P Train No. 63 properly to observe and obey a signal indication governing the movement of his train over a railroad crossing.

Respectfully submitted,

W. J. PATTERSON

Director.