INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2518

THE MIDLAND VALLEY RAILROAD COMPANY
AND
THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY COMPANY

REPORT IN RE ACCIDENT

AT MIDLAND TOWER, KANS., ON

AUGUST 16, 1941

SUMMARY

Railroads:	Midland Valley	:Chicago, Rock :Island & Pacific
Date:	August 16, 1941	
Location:	Midland Tower, Kans.	
Kind of accident:	Side collision	
Trains involved:	Freight	:Freight
Train numbers:	48	:98
Engine numbers:	75	:5034
Consist:	10 cars and caboose	:51 cars and caboose
Estimated speed:	2 m.p.h.	:17 m.p.h.
Operation:	Automatic interlocking	
Track:	Single; tangent; grade level	:Single; tangent; :0.225 percent as- :cending grade :northward
Weather:	Clear	
Time:	About 10:22 a.m.	
Casualties:	4 injured	
Cause:	Accident caused by failure to stop the C.R.I.& P. train in accordance with interlocking signal indications on account of insufficient stopping distance for maximum authorized speed between approach signal and home signal on the C.R.I.& P. at an automatic interlocking	
Recommendation:	That the C.R.I.& P. immediately take necessary measures to bring the interlocking involved in this accident into conformity with the requirements prescribed by the orders of this Commission.	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2518

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

THE MIDLAND VALLEY RAILROAD COMPANY
AND
THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY COMPANY

October 27, 1941

Accident at Midland Tower, Kans., on August 16, 1941, caused by failure to stop the C.R.I.& P. train in accordance with interlocking signal indications on account of insufficient stopping distance for the maximum authorized speed between approach signal and home signal on the C.R.I.& P. at an automatic interlocking.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On August 16, 1941, there was a side collision between a freight train of the Midland Valley Railroad and a freight train of the Chicago, Rock Island & Pacific Railway at Midland Tower, Kans., which resulted in the injury of four employees.

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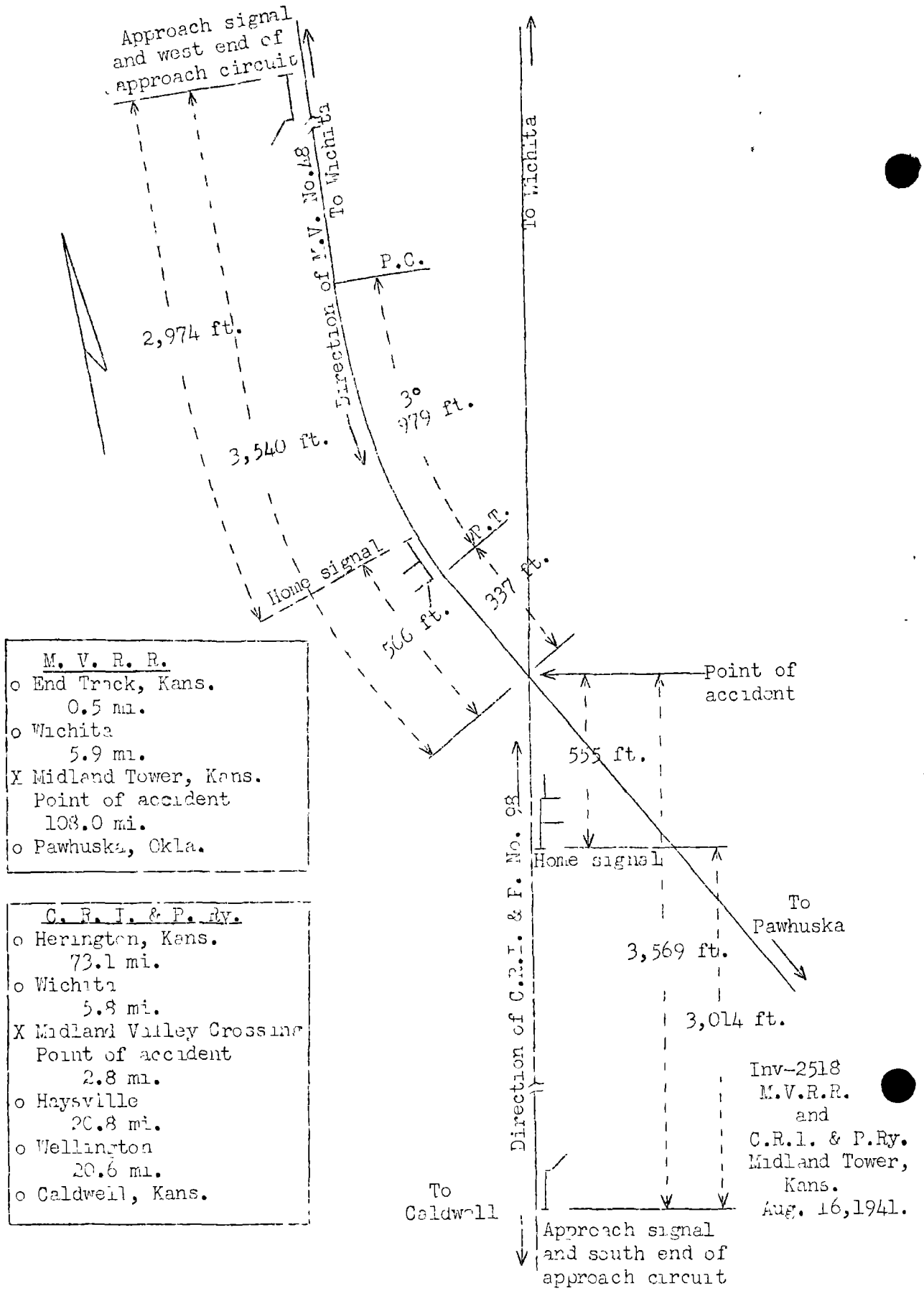
[1]Under authority of section 17(2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



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M.V.R.R.
and
C.R.I. & P.Ry.
Midland Tower,
Kans.
Aug. 16,1941.

Location of Accident and Method of Operation

This accident occurred at the intersection of the Midland Valley Railroad and the Chicago, Rock Island & Pacific Railway, hereinafter referred to, respectively, as the M.V. and the C.R.I.& P. The crossing, which is designated as Midland Tower, is located 5.9 miles east of Wichita, Kans., on the M.V., and 2.8 miles north of Haysville on the C.R.I.& P. Midland Tower is located on that part of the M.V. designated as the Western District, which extends between End Track, Wichita, Kans., and Pawhuska, Okla., a distance of 114.4 miles, and on that part of the Oklahoma Division of the C.R.I.& P. designated as Subdivision 38, which extends between Caldwell and Herington, Kans., a distance of 123.1 miles. In the vicinity of the point of accident both are single-track lines over which trains are operated by timetable and train orders; there is no form of block system in use. Time-table directions on the M.V. are east and west and on the C.R.I.& P., north and south. These tracks intersect at an angle of 41°36'.

As the crossing is approached from the west on the M.V. there are, in succession, a tangent about 4,000 feet in length, a 3° curve to the left 978.9 feet and a tangent 337.4 feet to the crossing and several miles beyond. The grade for east-bound trains is, successively, 0.011 percent descending a distance of 1,100 feet, level 400 feet, 0.073 percent ascending 600 feet, and 0.016 percent descending 200 feet to the crossing. As the crossing is approached from the south on the C.R.I.& P. there is a tangent 10.3 miles to the crossing and some distance beyond. The grade for north-bound trains is 0.113 percent ascending a distance of 3,900 feet and then 0.202 percent ascending 1,400 feet to the crossing.

Movements over the crossing are governed by an automatic interlocking. An approach signal and a home signal governing eastward movements on the M.V. are located, respectively, 3,540 feet and 566 feet west of the crossing. The approach signal is of the 1-arm, upper quadrant, semaphore type, fixed in a 45-degree position, and is continuously lighted. The home signal is of the 2-position, 2-arm, upper quadrant, semaphore type, approach lighted; the lower arm is fixed in horizontal position. The day aspects, indications and names of these signals which were involved in this accident are as follows:

Signal	Day aspect	Indication	Name
Approach	45 degrees	Restricted speed	Approach (caution)
Home	45 degrees	Restricted speed	Caution Signal

An approach signal and a home signal governing northward movements on the C.R.I.& P. are located, respectively, 3,569.2 feet and 555.4 feet south of the crossing. The approach signal is of the 1-arm, upper quadrant, semaphore type, fixed in a 45-degree position, continuously lighted. The home signal is of the 2-position, 2-arm, upper quadrant, semaphore type, approach lighted. The lower arm is fixed in horizontal position. The day aspects, indications and names of these signals which were involved in this accident are as follows:

Signal	Day aspect	Indication	Name
Approach	45 degrees	Proceed at restricted speed through the entire block	Permissive Signal
Home	Horizontal	Stop	Stop Signal

Each home signal normally displays a stop indication and if the conflicting route is not occupied clears automatically upon the approach of a train. On each line track circuits are provided in approach of the home signals. On the M.V. the approach circuit for eastward movements extends from a point 2,974 feet west of the eastward home signal, and on the C.R.I.& P. from a point 3,014 feet south of the northward home signal. The interlocking is so arranged that when an approaching train on either line enters its respective approach track-circuit, provided there is no conflicting train movement on the other line and the tracks within the home-signal limits on both lines are unoccupied, the home signal automatically displays an indication for the movement of the train over the crossing. The first train to enter its approach circuit establishes priority over a train on the other line and the home signals on the opposing line remain at stop until the first train has completed its movement through the interlocking.

Time-table instructions of the M.V. read in part as follows:

> Note 2. Crossing controlled by automatic signals. Normal position distant signal CAUTION. Home signal STOP. Trains must approach at restricted speed until home signal indicates PROCEED, and the way is clear.
>
> At railroad crossings where designated by time table are governed by standard interlocking signals automatically controlled by approaching

trains, all trains will approach home signals at such crossings at restricted speed, and if proceed signal is displayed, may proceed over the crossing at the speed prescribed by the time table rule.* * *

Operating rules of the M.V. read in part as follows:

DEFINITIONS

Restricted Speed.--Proceed prepared to stop short of train, obstruction or anything that may require the speed of a train to be reduced.

Operating rules of the C.R.I.& P. read in part as follows:

34. 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.

98. Trains and engines must approach * * * railroad crossings at grade, * * * prepared to stop, unless the switches are properly lined, signals indicate proceed, and track is clear. Where required by law, trains must stop.

The maximum authorized speed for freight trains on the M.V. is 30 miles per hour, and on the C.R.I.& P., 50 miles per hour. Within the limits of the interlocking involved the maximum authorized speed on both lines is 20 miles per hour.

Description of Accident

No. 48, an east-bound third-class M.V. freight train, consisted of engine 75, 1 auxiliary water car, 4 loaded and 5 empty cars, and a caboose. After a terminal air-brake test was completed this train departed from Wichita, 5.9 miles west of the crossing involved, at 10:05 a.m., according to the dispatcher's record of movement of trains, 1 hour 35 minutes late, and passed the home signal, which was displaying proceed-at-restricted-speed. When the engine was about 60 feet west of the crossing and while the train was moving at a speed of about 15 miles per hour, the engineman saw the other train approaching and applied the brakes in emergency. The engine moved upon the crossing and was nearly stopped when it was struck by C.R.I.& P. No. 98.

No. 98, a north-bound second-class C.R.I.& P. freight train, consisted of engine 5034, 50 loaded cars, 1 empty car, and a caboose. A terminal air-brake test of this train was conducted at El Reno Yard, Okla., 151.4 miles south of Midland Tower. At Caldwell, 44.2 miles south of Midland Tower, after the crews were changed, another air-brake test was made and the brakes functioned properly en route. This train departed from Caldwell at 9:20 a.m., according to the dispatcher's record of movement of trains, 1 hour 40 minutes late, passed Wellington, 23.6 miles south of Midland Tower and the last open office, at 9:53 a.m., 1 hour 38 minutes late, passed the approach signal at an estimated speed of 50 miles per hour, passed the home signal, which was displaying a stop indication, and, while moving at a speed of about 17 miles per hour, collided with M.V. No. 48.

There was no condition of engine 5034 that distracted the attention of the crew or obscured their vision. Both the northward approach signal and the northward home signal on the C.R.I.& P. could be seen from a north-bound engine throughout a distance of more than 2 miles. Because of track curvature to the left, the view from the right side of an east-bound M.V. engine of the eastward home signal on the M.V. was restricted to 198 feet; however, this signal could be seen from the left side of an east-bound engine throughout a distance of 2,974 feet. Because of a house and trees located in the southwest angle of the crossing, an approaching north-bound train on the C.R.I.& P. was obscured from the view of the M.V. crew and an approaching east-bound train on the M.V. was obscured from the view of the C.R.I.& P. crew.

The C.R.I.& P. engine struck the M.V. engine at the location of the right cylinder. The M.V. engine was derailed to the north and stopped, badly damaged, upright and practically parallel to the C.R.I.& P. track. The pilot, the front-end frames, the engine truck and the right cylinder and valve chamber were demolished. The tender was derailed but remained in line with the track; the left water-leg was badly damaged. The front truck of the first car of the M.V. train was derailed. The C.R.I.& P. engine was derailed to the right and stopped with its front end about 115 feet north of the crossing and 25 feet east of the C.R.I.& P. track; the rear end was on the roadbed. The engine leaned at an angle of 45 degrees to the left. The pilot beam was broken, the smoke box was badly damaged and the left side of the cab was twisted and crushed inward. The tender was derailed to the right and stopped on its right side at an angle of 45 degrees to the engine; the rear-end sheet was telescoped. The first seven cars of No. 98 were derailed and stopped practically upright and at right angles to the C.R.I.& P. track; these cars were

destroyed. The eighth car was derailed to the left, remained upright, and stopped, slightly damaged, about 50 feet south of the crossing. The front truck of the ninth car was derailed.

The weather was clear at the time of the accident, which occurred about 10:22 a.m.

The employees injured were the engineman, the fireman and the front brakeman of the C.R.I.& P. train, and the fireman of the M.V. train.

Interlocking Data

Tests of the interlocking made after the accident disclosed no abnormal condition of the control wires, relays or signal mechanisms. The lock and indication circuits operated properly and the interlocking was functioning as intended.

Mechanical Data

After the accident, the S-6 independent brake valve and the H-6 automatic brake valve were removed from the C.R.I.& P. engine and tested on a test rack at Armourdale, Kans. Both brake valves functioned properly and were in conformity with the requirements of the testing code.

Discussion

The M.V. train entered its approach circuit about 49 seconds before the C.R.I.& P. train entered its approach circuit. The eastward home signal on the M.V. displayed proceed-at-restricted-speed. This indication permitted the M.V. train to proceed over the crossing but it was required to be prepared to stop short of train or obstruction. The M.V. train was approaching the crossing at a speed of about 12 miles per hour and when the engine of this train was about 60 feet west of the crossing the engineman observed the C.R.I.& P. train closely approaching the crossing. He immediately placed the brake valve in emergency position, but the distance was not sufficient to stop short of the crossing. The speed of the M.V. train was about 2 miles per hour when the C.R.I.& P. engine struck the M.V. engine. The northward home signal on the C.R.I.& P. displayed stop for the C.R.I.& P. train. This indication required the C.R.I.& P. train to stop short of the northward home signal; however, it did not stop short of the signal and was moving at a speed of about 17 miles per hour when it struck the M.V. engine on the crossing. All the employees involved understood the requirements of the signal indications which were displayed.

There was considerable variation in the statements of employees concerning the nature and the location of the brake applications which were made on the C.R.I.& P. train prior to the accident. The engineman said that at a point about 1/2 mile south of the approach signal the speed of his train was about 50 miles per hour. The throttle was open and he was maintaining a lookout ahead. He made a 12-pound brake-pipe reduction, which was not released, and the brakes seemed to be effective; however, speed had not been reduced materially when his engine passed the approach signal. At that time he observed that the home signal continued to display stop for his train and he moved the brake valve to emergency position and closed the throttle. According to the statement of the fireman, the first brake-pipe reduction, which appeared to be a light reduction, was made at a point about 360 feet south of the approach signal and the emergency application was made at a point about 150 feet north of the approach signal. The front brakeman said that the first brake-pipe reduction was made at a point about 1,000 feet south of the approach signal, that the emergency application was made at a point about 1,800 feet south of the home signal, and that the speed of the train had not been reduced materially prior to the emergency application of the brakes. According to the statement of the conductor, the brake-pipe pressure gauge in the caboose indicated that the first brake-pipe reduction was about 12 or 15 pounds. The weather was clear and there was an unrestricted view of the home signal a distance of 2 miles.

The brakes on the C.R.I.& P. train were in proper operating condition, but the results clearly show that the brakes were not applied at a sufficient distance to stop short of the home signal. The engineman thought the distance between the approach signal and the home signal was 1 mile; however, the distance was only 3,014 feet. The engineman said that a distance of 1 mile was sufficient in which to stop a train of 2,707 tons from a speed of 50 miles per hour by a service application of the brakes. The road foreman of engines who supervised the C.R.I.& P. engineman involved in the accident said that a train of similar tonnage could be stopped from a speed of 50 miles per hour in a distance of 4,000 feet, but that braking should be started at least 1 mile south of the home signal.

Section 304 of the rules, standards and instructions for installation, inspection, maintenance and repair of interlocking signals, prescribed by the Commission's order of April 13, 1939, provides as follows:

> Approach and home signals shall be spaced at least stopping distance apart, or where not so spaced an equivalent stopping distance shall be provided by two or more signals arranged to display restrictive indications approaching home signal, the indication of which requires such restrictive indications.

The investigation disclosed that the distance between the approach signal and the home signal on the C.R.I.& P. was insufficient for a train moving at maximum authorized speed at the approach signal to be stopped short of the home signal. Under the order of April 13, 1939, the effective date of section 304 as applied to the interlocking involved in this accident was September 1, 1941; however, on petition of the C.R.I.& P. this effective date has been extended to January 1, 1942. This investigation disclosed that this carrier had not made provision for safeguarding operation pending the respacing of signals so as to provide adequate stopping distance between the approach and the home signals involved in this accident.

Cause

It is found that this accident was caused by failure to stop the C.R.I.& P. train in accordance with interlocking signal indications on account of insufficient stopping distance for maximum authorized speed between the approach signal and the home signal on the C.R.I.& P. at an automatic interlocking.

Recommendation

It is recommended that the Chicago, Rock Island & Pacific Railway Company immediately take necessary measures to bring the interlocking involved in this accident into conformity with the requirements prescribed by the orders of this Commission.

Dated at Washington, D.C., this twenty-seventh day of October, 1941.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.