INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2493

THE CHICAGO GREAT WESTERN RAILWAY COMPANY

AND

THE MISSOURI PACIFIC RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT LEAVENWORTH, KANS., ON

MARCH 29, 1941

SUMMARY

Railroads:	Chicago Great Western	: Missouri Pacific
Date:	March 29, 1941	
Location:	Leavenworth, Kans.	
Kind of accident:	Side collision	
Trains involved:	C. G. W. passenger	: M. P. freight
Train numbers:	901	: 178
Engine numbers:	930	: 6000
Consist:	6 cars	: 35 cars, caboose
Speed:	10 m. p. h.	: 3-8 m. p. h.
Operation:	Centralized-traffic-control system	
Track:	Single track on each railroad; tangent on M. P. and No. 10 turnout on the C. G. W.; 0.6 percent ascending grade eastward	
Weather:	Clear	
Time:	5:59 p. m.	
Casualties:	3 injured	
Cause:	Accident caused by failure to obey interlocking signal indication	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2493

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

THE CHICAGO GREAT WESTERN RAILWAY COMPANY

AND

THE MISSOURI PACIFIC RAILROAD COMPANY

May 27, 1941

Accident at Leavenworth, Kans., on March 29, 1941, caused by failure to obey interlocking signal indication.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On March 29, 1941, there was a side collision between a Chicago Great Western Railway passenger train and a Missouri Pacific Railroad freight train at Leavenworth, Kans., which resulted in the injury of two passengers and one employee.

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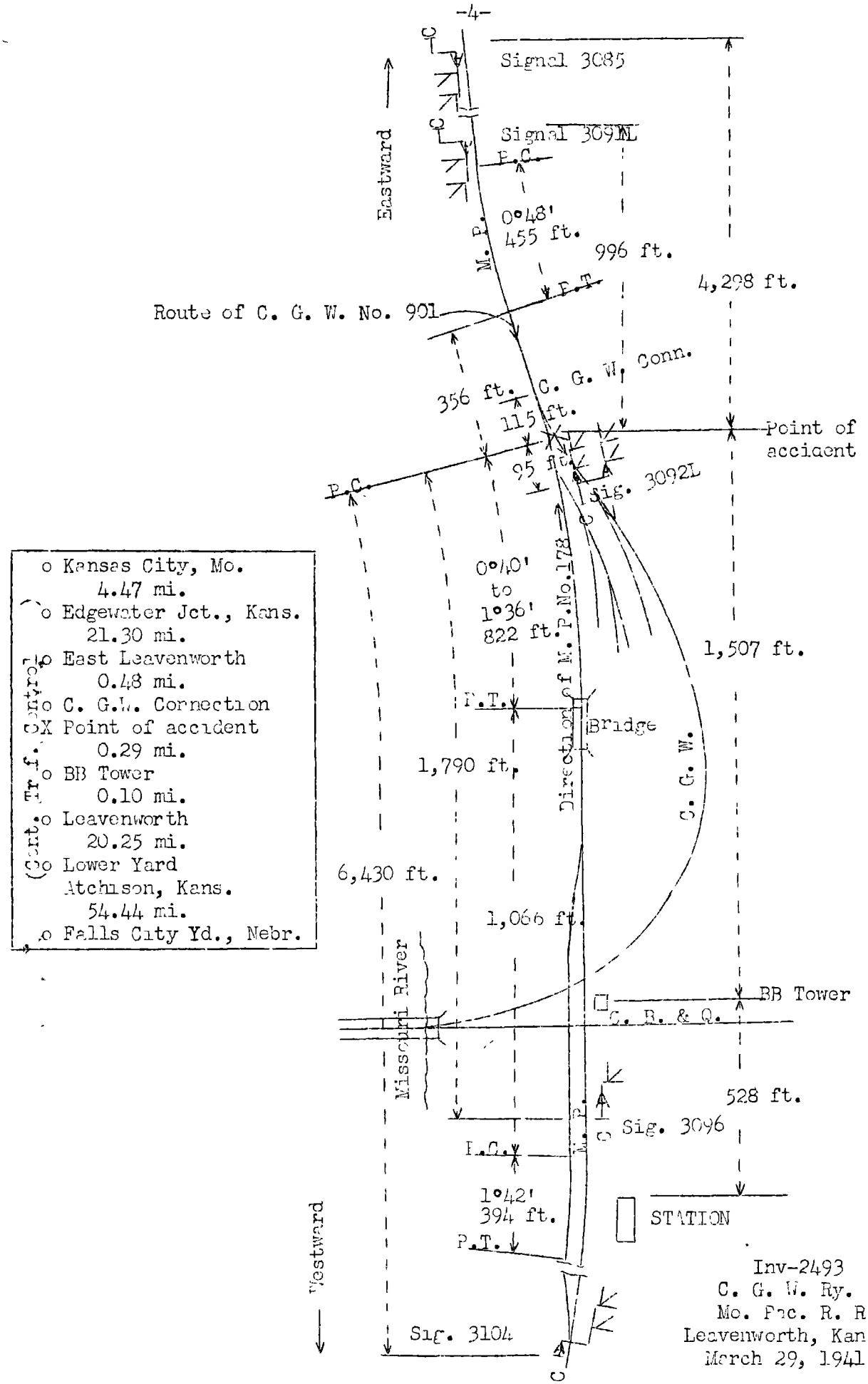
[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv-2493
C. G. W. Ry.
Mo. Pac. R. R.
Leavenworth, Kans.
March 29, 1941.

Location and Method of Operation

The accident occurred at a connection of the tracks of the Chicago Great Western Railway and the Missouri Pacific Railroad, hereinafter referred to as the C. G. W. and the M. P., respectively. Leavenworth is located on that part of the Iowa Division of the C. G. W. designated as the Seventh District which extends between Leavenworth, Kans., and Conception, Mo., a distance of 74.2 miles, and on that part of the Omaha and Northern Kansas Divisions of the M. P. designated as the Atchison District which extends between Central Avenue, Kansas City, Kans., and Falls City Yard, Nebr., a distance of 98.43 miles. Trains of the C. G. W. are operated over the M. P. between Kansas City and C. G. W. Connection at Leavenworth, a distance of 23.35 miles. In the vicinity of the point of accident the M. P. is a single-track line over which trains are operated by a centralized-traffic-control system. Trains move in either direction by signal indications, which supersede time-table superiority and take the place of train orders. In the immediate vicinity of the point of accident the C. G. W. is a single-track line over which trains are operated by timetable and train orders; there is no block system in use. On the M. P. the C. T. C. system is controlled from BB Tower, located 528 feet east of the station at Leavenworth. At a point 1,622 feet east of BB Tower there is a remote-control switch having a No. 10 turnout and designated as C. G. W. Connection; it is facing-point for west-bound trains, controlled from BB Tower, and used by C. G. W. trains moving from the M. P. main track to the C. G. W. main track. The accident occurred at the fouling point at the C. G. W. Connection switch. The C. G. W. track diverges from the M. P. track toward the south at an angle of about 12 degrees, then turns sharply to the north and crosses the M. P. main track at a point 25 feet east of BB Tower. A single-track line of the Chicago, Burlington & Quincy Railroad crosses the M. P. at a point 53 feet west of BB Tower. Both crossings are protected by an interlocking controlled from BB Tower.

As the point of accident is approached from the east there are, in succession, a compound curve to the left 1,726 feet in length having a maximum curvature of 3°28', a tangent 294 feet, a 0°48' curve to the left 455 feet, and a tangent 356 feet; the accident occurred at the west end of the latter-mentioned tangent. As the point of accident is approached from the west there are, in succession, a 1°42' curve to the left 394 feet, a tangent 1,066 feet, a compound curve to the left having a maximum curvature of 1°36' and extending 822 feet to the point of accident. The grade for west-bound trains is level. The grade for east-bound trains is, successively, 0.55 percent

descending a distance of 1,000 feet, level 1,400 feet, 0.70 percent descending 400 feet, level 300 feet, and 0.60 percent ascending 300 feet to the point of accident.

Signals 3085 and 3091L, which govern westward movements on the M. P. and entry to the C. G. W. Connection track, are located, respectively, 4,183 and 881 feet east of the Connection track switch. These signals are of the 2-unit, color-light type and are semi-automatic. The involved aspects, indications and names are as follows:

Signal	Aspect	Indication	Name
3085	Yellow-over-red	Proceed at restricted speed through the entire block	Permissive signal
3091L	Red-over-yellow	Proceed via diverging route at restricted speed through the entire block	Approach restricting signal

Signals 3104, 3096, and 3092L, which govern eastward movements, are located, respectively, 6,545 feet, 1,905 feet, and 210 feet west of the Connection track switch. Signals 3104 and 3092L are of the 2-unit, color-light type; signal 3096 is of the 1-unit, color-light type. Signal 3096 is both an interlocking home signal at BB Tower and an approach signal for signal 3092L, the interlocking home signal at C. G. W. Connection. The involved aspects, indications and names are as follows:

Signal	Aspect	Indication	Name
3104	Green-over-red	Proceed	Clear signal
3096	Yellow	Proceed at restricted speed through the entire block	Permissive signal
3092L	Red-over-red	Stop	Stop signal

Rules of the operating department of the M. P. read as follows:

> Definitions.
>
> Centralized Traffic Control.-A term applied to a system of railroad operation by means of which the movement

of trains over routes and through blocks on a designated section of track or tracks is directed by signals controlled from a designated point, superseding time table superiority of trains, and without requiring the use of train orders.

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

54. 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.

Between signal 3096 and the C. G. W. Connection track switch the maximum authorized speed for all trains is 30 miles per hour. The speed of trains moving through the turnout at C. G. W. Connection is 10 miles per hour.

It was daylight and the weather was clear at the time of the accident, which occurred at 5:59 p. m.

Description

No. 901, a west-bound first-class C. G. W. passenger train, with Conductor Smith and Engineman Slorah in charge, consisted of engine 930, two baggage cars, one mail car, one baggage car, one coach, and one Pullman sleeping car, in the order named; all cars were of steel construction. This train departed from Kansas City, Mo., 26.64 miles east of Leavenworth, at 5:20 p. m., according to the train sheet, passed U. P. Jct., 3.64 miles east of C. G. W. Connection and the last open office, at 5:53 p. m., entered the C. G. W. Connection, and while it was moving at a speed of about 10 miles per hour the third, fourth and fifth cars were struck by M. P. No. 178.

No. 178, an east-bound M. P. second-class freight train, with Conductor Corning and Engineman Wilson in charge, consisted of engine 6000, 2 empty and 35 loaded cars and a caboose. This train departed from Atchison, 21.42 miles west of C. G. W. Connection, at 5:30 p. m., according to the train sheet, 30 minutes late, passed BB Tower at 5:58 p. m., passed signal 3104, which was displaying proceed, passed signal 3096, which was

displaying restricted-speed, passed signal 3092L, which was displaying stop, and, while moving at a speed estimated as from 3 to 8 miles per hour, collided with No. 901.

Engine 6000, of No. 178, was badly damaged, but was not derailed. The right side of the third car of No. 901 was scraped and torn. The fourth car was derailed and overturned on its left side and the entire right side was torn out. The front truck of the fifth car was derailed and the front vestibule was badly damaged.

The employee injured was the baggageman of No. 901.

Summary of Evidence

Engineman Slorah, of No. 901, stated that a terminal air-brake test was made before the train departed from Kansas City. Signal 3085 displayed yellow-over-red and signal 3091L displayed red-over-yellow, which required that the speed be reduced before the train entered the C. G. W. Connection. As his train was approaching the Connection, the throttle was in drifting position, the speed was about 10 miles per hour, and he saw No. 178 about 1,500 feet west of the Connection. As his train entered the switch, No. 178 was clearly within his view but he was not alarmed that it would not stop short of the fouling point as it appeared to be moving under control. The accident occurred about 6 p. m., at which time it was daylight and the weather was clear.

Fireman Pallas, of No. 901, corroborated the statement of his engineman.

The statements of Conductor Smith and Flagman Collins, of No. 901, added nothing of importance.

Engineman Wilson, of No. 178, stated that at St. Joseph, Mo., 41.9 miles west of C. G. W. Connection, a terminal air-brake test was made, and the brakes functioned properly en route. As his train was approaching Leavenworth the speed was about 35 miles per hour, the throttle was closed and he was maintaining a lookout ahead. Signal 3104 displayed proceed for his train. When the train was about 25 car lengths west of signal 3096 he observed that it displayed a yellow aspect, which he understood required that the speed of his train be controlled and his train approach the next signal prepared to stop, and he made an 8-pound brake-pipe reduction; however, because the speed did not appear to be reduced properly, at a point about 100 feet west of signal 3096 he made a further brake-pipe reduction which slowed the train down and his engine passed signal 3096 at a

speed of about 25 miles per hour. When the engine was leaving a bridge located 720 feet west of signal 3092L the speed was about 15 miles per hour and the fireman informed him that signal 3092L displayed stop. The engineman immediately moved the brake valve to emergency position; however, because of previous brake-pipe reductions the emergency application was not effective. At a point about 3 or 4 car lengths west of the fouling point of the C. G. W. Connection, he opened the sander valve, placed the reverse lever in position for backward motion and opened the throttle, but failed to avert the accident. His engine stopped 10 feet east of the fouling point of the turnout. After he made the initial brake-pipe reduction the brakes remained applied throughout the distance to the point where the accident occurred. He said that he was last examined on the operating rules in 1940. He had been operating an engine over this district during the preceding 21 months and was thoroughly familiar with the physical characteristics of the territory involved. He expressed the opinion that a freight train moving at a speed of 30 miles per hour could not be stopped by a service application of the brakes in less than 60 car lengths.

Fireman Thompson, of No. 178, stated that he and the engineman called indications displayed by signals 3104, 3096 and 3092L. As his train was approaching the point where the accident occurred the speed was about 30 miles per hour, the throttle was closed and he was maintaining a lookout ahead. The engineman made a brake-pipe reduction west of signal 3096, which displayed a yellow aspect. The engine passed that signal at a speed of 20 or 25 miles per hour. A second reduction was made near BB Tower. Fireman Thompson said that before his engine entered the bridge west of signal 3092L, that signal was displaying stop and he called the indication to the engineman, who applied the brakes in emergency when the engine was near the bridge. The fireman was not alarmed that his train would not stop short of the signal until the engineman placed the reverse lever in position for backward motion; at that time the speed was about 8 miles per hour, the engine was about 1 or 2 car lengths west of signal 3092L and the fireman saw No. 901 and jumped off.

Front Brakeman Cook, of No. 178, stated that as his train was approaching the point where the accident occurred the speed was about 30 miles per hour. He left the brakeman's booth and stood on the top of the tender and maintained a lookout ahead. He observed that signal 3104 displayed a restricted-speed indication. He felt the brakes become applied before the engine passed signal 3096 and was confident that the speed was being controlled properly and that the train could be stopped short

of signal 3092L. He said that when the engine crossed the bridge west of signal 3092L that signal displayed stop and he felt the brakes apply in emergency. When the engine was 5 car lengths west of signal 3092L he heard the engine exhaust in backward motion and he jumped off; the speed was 3 or 4 miles per hour. He was last examined on the operating rules in 1940. He understood that when a signal displays a restricted-speed indication it requires that a train be operated prepared to stop short of the next signal in advance. Action to control the speed of a train should begin at a signal which displays restricted speed.

Conductor Corning, of No. 178, stated that as his train was approaching the point where the accident occurred the speed was about 40 miles per hour and he was on the left side of the cupola. Brake-pipe pressure of 70 pounds was being maintained. Because of trailing smoke he did not see signal 3096. The brake-pipe pressure gauge in the caboose indicated a brake-pipe reduction of 10 pounds, which was followed soon afterward by a further brake-pipe reduction, and the speed was reduced to 20 miles per hour. When the caboose was about 2,000 feet west of C. G. W. Connection he observed across the curve that signal 3092L was displaying stop. The brake-pipe pressure became depleted and the brakes remained applied continuously after the initial brake-pipe reduction was made. The train stopped smoothly and he was unaware of the occurrence of the accident until several minutes after the train stopped. He said that in this instance No. 178 was operated through the territory involved in a manner similar to the customary operation.

The statement of Flagman Davis, of M. P. No. 178, added nothing of importance.

Leading Car Inspector Miller and Car Inspector Walters, of the Union Terminal Railway Company, St. Joseph, Mo., stated that they conducted a terminal air-brake test on No. 178 before it departed from St. Joseph. Each brake applied and released properly and the brake-cylinder piston-travel was within the prescribed limits.

Signalman Dodson, at BB Tower, stated that the centralized-traffic-control machine was functioning as intended and the signals displayed indications properly for movement of the trains involved. When No. 178 passed the tower the speed was 25 or 28 miles per hour.

Signal Foreman Thornton, of the M. P., stated that he arrived at the scene of the accident at 8:30 p. m. He inspected

and tested all signals and signal apparatus between points 0.5 mile east of C. G. W. Connection and 1.1 miles west of it. The signals functioned properly.

Superintendent Kendall, of the M. P., stated that a rules instructor conducts rules classes regularly and supervisory officials also hold instruction classes at frequent intervals. Efficiency tests are made frequently for the purpose of observing whether employees comply with signal indications. He said that when a signal displays restricted speed trains are required to be operated under control beyond the signal and to be prepared to stop short of the next signal in advance.

Observations of the Commission's Inspectors

The Commission's inspectors observed that signal 3096 could be seen from the right side of an east-bound engine a distance of 1,800 feet and from the left side a distance of 1,600 feet. From the right side of the cab of an east-bound engine signal 3092L could be seen a distance of 1,692 feet, and from the left side a distance of 1,810 feet.

Discussion

According to the evidence, the route at C. G. W. Connection was lined for No. 901, a west-bound C. G. W. passenger train, to move from the M. P. track to the C. G. W. track and the signals displayed proper indications for that movement. No. 901 was entering the turnout and moving at a speed of about 10 miles per hour when the third and fourth cars were struck by No. 178, an east-bound M. P. freight train, which was moving at a speed estimated at from 3 to 8 miles per hour.

Signals 3104, 3096 and 3092L, located 6,545, 1,905 and 210 feet west of the switch involved, displayed proceed, restricted speed, and stop, respectively, for No. 178. In relation to the movement of No. 901, these signals displayed proper indications for No. 178. According to the evidence, when the engine of No. 178 was about 1,000 feet west of signal 3096, the approach signal, the speed of the train was 35 or 40 miles per hour. The engineman made an 8-pound brake-pipe reduction and when the engine was about 100 feet west of signal 3096 he made another brake-pipe reduction, and the speed of his train had been reduced to about 25 miles per hour when the engine passed that signal. When the engine was about 700 feet west of signal 3092L, the home signal, the engineman placed the brake valve in emergency position and when the engine was about 125 feet west of the home signal, he placed the reverse lever in position for

backward motion and opened the throttle. From the time the first brake-pipe reduction was made to the time of the collision, the brakes were not released. The weather was clear and the indication of signal 3092L could be seen a distance of 1,700 or 1,800 feet. The brakes had been tested and they functioned properly en route. According to the rules, No. 178 was permitted to move at maximum authorized speed of 30 miles per hour until the engine reached signal 3096 and then it was required to proceed prepared to stop short of train, obstruction or signal 3092L; however, this train passed signal 3092L and struck No. 901 at a point 95 feet beyond that signal. Signals 3096 and 3092L were 1,695 feet apart. The engineman said that a distance of about 2,500 feet was necessary in which to stop his train. According to the evidence, the initial brake-pipe reduction was made more than that distance from signal 3092L, but although the engineman thought this application did not reduce the speed properly the subsequent brake-pipe reductions were not made in time to prevent the overrunning of the stop signal.

The investigation of this accident indicates that there is considerable question whether the spacing of signals in this territory provides adequate stopping distances for trains which are operated at maximum authorized speeds, and this matter should be promptly checked by the Missouri Pacific Railroad.

Cause

It is found that this accident was caused by failure to obey an interlocking signal indication.

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

By the Commission, Commissioner Patterson.

W. P. BARTEL,

(SEAL) Secretary.