

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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INVESTIGATION NO. 2503  
THE MISSOURI PACIFIC RAILROAD COMPANY  
AND  
THE KANSAS CITY SOUTHERN RAILWAY COMPANY  
REPORT IN RE ACCIDENT  
NEAR FULLER, KANS., ON  
MAY 10, 1941

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SUMMARY

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Railroads: Missouri Pacific :Kansas City Southern  
Date: May 10, 1941  
Location: Fuller, Kans.  
Kind of accident: Side collision  
Trains involved: Freight :Passenger  
Train numbers: 793 :15  
Engine numbers: 1565 :1  
Consist: 33 cars and caboose :6 cars  
Speed: 20 m.p.h. :20-30 m.p.h.  
Operation: Automatic interlocking  
Track: Single; tangent; grade:Single; tangent;  
practically level : 0.50 percent  
: ascending grade  
: southward  
Weather: Clear  
Time: 12:33 a.m.  
Casualties: 3 injured  
Cause: Accident caused by failure properly to  
control speed of K.C.S. train in com-  
pliance with interlocking signal in-  
dications.

INTERSTATE COMMERCE COMMISSION

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INVESTIGATION NO. 2503

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

THE MISSOURI PACIFIC RAILROAD COMPANY

AND

THE KANSAS CITY SOUTHERN RAILWAY COMPANY

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June 28, 1941

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Accident near Fuller, Kans., on May 10, 1941, caused by  
failure properly to control speed of K.C.S. train in com-  
pliance with interlocking signal indications.

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REPORT OF THE COMMISSION<sup>1</sup>

PATTERSON, Commissioner:

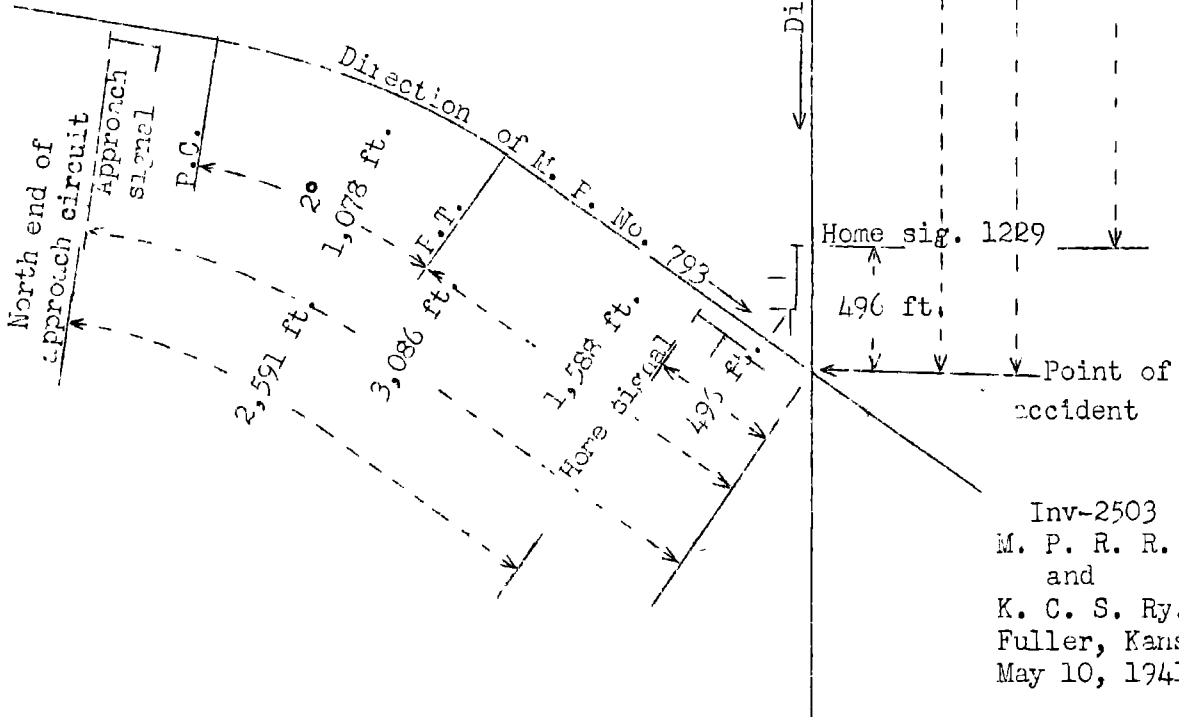
On May 10, 1941, there was a side collision between a  
freight train of the Missouri Pacific Railroad and a passenger  
train of the Kansas City Southern Railway near Fuller, Kans.,  
which resulted in the injury of one dining-car employee and two  
train-service employees.

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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 Patterson for consideration and disposition.

- K. C. S. Ry.
- o Kansas City, Mo. 5.3 mi.
  - o Air Line Jct., Mo. 112.9 mi.
  - o Mulberry 2.5 mi.
  - o Fuller, Kans. 2.3 mi.
  - X Mo. Pac. Crossing (Point of accident) 6.3 mi.
  - o Pittsburg, Kans.

- M. P. R. R.
- o Ft. Scott, Kans. 0.16 mi.
  - o Joplin Div. Jct. 22.57 mi.
  - o Arma 4.69 mi.
  - X K. C. S. Crossing (Point of accident) 2.27 mi.
  - o Cornell Jct., Kans.



Inv-2503  
 M. P. R. R.  
 and  
 K. C. S. Ry.  
 Fuller, Kans.  
 May 10, 1941

### Location and Method of Operation

The accident occurred at the intersection of the Missouri Pacific Railroad and the Kansas City Southern Railway, hereinafter referred to, respectively, as the M. P. and the K. C. S. The crossing is located 4.69 miles south of Arma, Kans., on the M. P. and 2.3 miles south of Fuller on the K. C. S. Arma is located on that part of the Joplin Division of the M. P. designated as the Cornell Subdivision which extends between Joplin Division Jct. and Cornell Jct., Kans., a distance of 29.53 miles. Fuller is located on that part of the Northern Division of the K. C. S. designated as the First District which extends between Kansas City, Mo., and Pittsburg, Kans., a distance of 129.3 miles. In the vicinity of the point of accident both are single-track lines. On the M. P. trains are operated by timetable and train orders; there is no block system in use. On the K. C. S. trains are operated by timetable, train orders and an automatic block-signal system. On both railroads time-table directions are north and south, but according to compass directions the M. P. track extends northwest to southeast and the K. C. S. track extends from northeast to southwest. These tracks intersect at an angle of  $54^{\circ}51'$ . As the crossing is approached from the north on the M. P. there is a  $2^{\circ}$  curve to the right 1,078 feet in length and then a tangent 1,588 feet to the crossing and some distance beyond. The grade is practically level. As the crossing is approached from the north on the K. C. S. there are, in succession, a  $0^{\circ}30'$  curve to the right 987 feet in length and a tangent 3,180 feet to the crossing. The grade for south-bound trains is 0.50 percent ascending a distance of 3,400 feet to the crossing.

Movements over the crossing are governed by an automatic interlocking. An approach signal and a home signal governing southward movements on the M. P. are located, respectively, 3,086 feet and 496 feet north of the crossing. The approach signal has a fishtail blade fixed in horizontal position and a yellow reflector-button unit mounted on the mast under the blade. The home signal is of the 2-position, 2-arm, upper quadrant, semaphore type, continuously lighted; the lower arm is fixed in horizontal position. The aspects, indications and names of these signals which were involved in this case are as follows:

<u>Signal</u>	<u>Night Aspect</u>	<u>Indication</u>	<u>Name</u>
Approach	Yellow	Proceed at restricted speed	Restricted speed
Home	Green-over-red	Proceed	Clear Signal

The indications of the automatic block-signal system on the K. C. S. are carried through the interlocking. Signals 1225 and 1229 governing southward movements on the K. C. S. are located, respectively, 3,203 feet and 496 feet north of the crossing. These signals are of the 3-position, upper quadrant, semaphore type, approach lighted. Signal 1225, of the 1-arm type, is the approach signal for the interlocking and its normal indication is approach. Signal 1229, which is the home signal, is of the 2-arm type; the lower arm is fixed in horizontal position. The aspects, indications and names of these signals which were involved in this case are as follows:

<u>Signal</u>	<u>Night Aspect</u>	<u>Indication</u>	<u>Name</u>
1225	Yellow	Approach next home signal prepared to stop	Caution Signal
1229	Red-over-red	Stop	Stop Signal

Each home signal normally displays stop and clears automatically upon the approach of a train. Track circuits are provided in approach of the home signals on the M. P. and in approach of the approach signals on the K. C. S. On the M. P. the approach circuit for southward movements extends from a point 2,591 feet north of the southward home signal, and on the K. C. S. from a point 2,630 feet north of the southward approach 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 movement of the train over the crossing and, in addition, when the home signal on the K. C. S. clears, its approach signal will display proceed. The first train to enter its approach circuit establishes priority over a train on the other line and the home signal on the opposing line remains at stop until the first train has completed its movement through the interlocking.

Instructions of the M. P. pertaining to operation over crossings read in part as follows:

10-A. Automatic Interlockings:

\* \* \*

Arma \* \* \*

Normal indication of Approach  
Signals - "Proceed at Restricted Speed."

\* \* \* both approach signals at Arma \* \* \* have fixed indication "Proceed at Restricted Speed." Restricted speed at these locations shall not exceed twenty miles per hour, to apply from approach signal until crossing is occupied, \* \* \*

\* \* \*

Rule 34 of the K. C. S. Transportation Department reads as follows:

The engineman and fireman must, when practicable, communicate to each other by its name the indication of all signals affecting the movement of their train.

The maximum authorized speed for passenger trains on the K. C. S. is 70 miles per hour on curves and 80 miles per hour on tangents; within the limits of interlockings speed is restricted to 35 miles per hour.

From the approach signal to the crossing the maximum authorized speed for all trains on the M. P. is 20 miles per hour.

The weather was clear and the moon was shining at the time of the accident, which occurred at 12:33 a.m.

#### Description

No. 793, a south-bound second-class M. P. freight train, with Conductor Carrithers and Engineman Priestley in charge, consisted of engine 1565, 33 empty cars and a caboose. This train departed from Ft. Scott, 27.42 miles north of the crossing involved, at 10:25 p.m., according to the train sheet, 2 hours 25 minutes late, passed the approach signal about 12:30 a.m., according to the statement of the engineman, passed the home signal, which was displaying proceed, and when it was moving over the crossing at a speed of 20 miles per hour the twenty-ninth car was struck by K. C. S. No. 15.

No. 15, a south-bound first-class K. C. S. passenger train, with Conductor Carter and Engineman Guinn in charge, consisted of Diesel-electric engine 1, three baggage cars, one mail-baggage car, one coach, and one Pullman sleeping car, in the order named; the first three cars had steel underframes and steel side sheets, and the other cars were of all-steel construction. This train departed from Kansas City, 120.7 miles north of Fuller, at 10:06 p.m., according to the train sheet, 11 minutes late, passed Eve, 21.3 miles north of Fuller and the

last open office, at 12:10 a.m., 14 minutes late, approached the crossing involved at a speed between 60 and 65 miles per hour, passed home signal 1229, which was displaying stop, and, while moving at an estimated speed of 20 to 30 miles per hour, struck the side of M. P. No. 793.

K. C. S. engine 1 was derailed to the left but remained upright, stopped at an angle of 45 degrees to the track with its rear end fouling the track about 50 feet beyond the crossing and was slightly damaged. The first car of this train stopped on the crossing and was derailed; also the front truck of the second car was derailed. The twenty-ninth, thirtieth, and thirty-first cars of the M. P. train were derailed to the south of the M. P. track and parallel to the K. C. S. track. The twenty-ninth car stopped upside down about 50 feet from the crossing and east of the K. C. S. engine. The thirtieth car was west of the K. C. S. engine, and the thirty-first car was parallel to the first car of the K. C. S. train. The front truck of the thirty-second car was derailed; this car stopped just west of the crossing.

The employees injured were the engineman of the K. C. S. train and the conductor of the M. P. train. The injured dining-car employee was on the K. C. S. train.

#### Summary of Evidence

Engineman Priestley, of M. P. No. 793, stated that as his train entered the approach circuit at the approach signal his train was moving about 20 miles per hour; he saw the top arm of the home signal change from red to green and he called its indication to the fireman. As his train neared the crossing he observed that the northward home signal on the K. C. S. was displaying stop and as his engine was moving over the crossing he saw the headlight of a south-bound K. C. S. train, which appeared to be some distance away. His train continued at a speed of 20 miles per hour until it was struck by the K. C. S. train. The air brakes on his train became applied in emergency and he immediately lapped the brake valve and closed the throttle. He thought the accident occurred about 12:33 a.m. Judging from the speed of his train and the distance traversed he thought his engine passed the approach signal about 12:30 a.m.

Fireman Lipsey, of M. P. No. 793, stated that he called the proceed indication displayed by the home signal when his engine was about 300 or 400 feet north of it. As his engine passed over the crossing he saw the reflection of the headlight of the K. C. S. train just as it was coming around the curve, and he observed that the arms of the home signal governing the movement of that train were in horizontal position. When he



saw the K. C. S. train pass the home signal he called to his engineman and very soon afterward the collision occurred. He estimated that the K. C. S. train was moving about 40 miles per hour as it approached and said that when it was about 100 feet from the crossing the speed was reduced.

Front Brakeman Wadley, of M. P. No. 793, stated that he was in the brakeman's cab on the tender and as his engine passed over the crossing he saw the K. C. S. train, which was then on tangent track.

Conductor Carrithers, of M. P. No. 793, stated that he saw the home signal governing the movement of his train change from red to green. He was in the left side of the caboose cupola and saw the reflection of the headlight of the K. C. S. train but was unable to judge its distance from the crossing; however, judging from its speed, he knew that it was not going to stop short of the crossing.

Flagman Rice, of M. P. No. 793, stated that he was in the right side of the cupola when he saw the K. C. S. train north of its home signal. After the accident occurred he observed that the home signal on the K. C. S. displayed stop.

Fireman Freeman, of K. C. S. No. 15, stated that the air brakes were tested at Kansas City, and the brakes functioned properly en route. As his train was departing from Mulberry, 2.5 miles north of Fuller, he went to the rear of the engine room and was draining the boiler that provides steam heat for the train when he heard the motors begin to idle; then the brakes became applied in emergency, and about 20 seconds later the collision occurred. He proceeded to the cab, found the west door open, the motors idling and the headlight burning. He found the engineman lying on the west side of the track near the crossing. He later observed that the throttle was in closed position and the brake valve in emergency position. He was unable to estimate the speed of his train just prior to the accident, but previously the engineman had always observed the 35-mile-per-hour speed restriction at the crossing involved. The engineman had been sounding the crossing whistle signals en route, but the fireman could not give the location at which any signal was sounded just prior to the accident. The engineman appeared to be in normal condition on the night of the accident. The fireman thought the engineman was wearing glasses when the train was stopped at Mulberry. Fireman Freeman stated that on some trips all his time is spent in the engine room except when the train is passing train-order signals.

Conductor Carter, of K. C. S. No. 15, stated that after his train left Mulberry the speed did not exceed 65 miles per

hour. Between Fuller and the crossing involved there are several highway grade crossings; he heard the engineman sound the crossing whistle signal but he was unable to give the exact locations where it was sounded. His train was moving about 60 miles per hour at the approach signal, then the speed was reduced to 50 or 55 miles per hour but he did not know whether this reduction was the result of a light application of the brakes or the closing of the throttle. The first indication of anything wrong was an application of the brakes in emergency. The collision occurred 20 or 25 seconds later. He thought the speed had been reduced to 20 or 25 miles per hour at the time of the accident, which occurred at 12:33 a.m. Soon after the train stopped he observed that home signal 1229 was displaying stop.

Flagman Emerson, of K. C. S. No. 15, stated that as his train was nearing the home signal and moving about 60 miles per hour he felt an emergency application of the air brakes. The collision occurred about 30 seconds later, at which time the speed had been reduced to about 30 miles per hour. As soon as the train stopped he went back to flag and found both the home signal and the approach signal displaying stop.

Because of the serious condition of Engineman Guinn, of K. C. S. No. 15, as a result of the accident, a statement could not be obtained from him at the time of the investigation. A month later he was still unable to make a statement.

Signal Maintainer Isenburg, of the K. C. S., stated that he arrived at the scene of accident at 2:30 a.m. and observed that home signal 1229 was displaying stop. He found that the control case at the crossing was demolished and the junction pole was dislodged and was broken off about 6 feet above the ground line. The line wires and cable connections were not damaged. Tests made of the signals and undamaged relays disclosed no abnormal condition. There was no defect in the signal mechanism. The wires and cables were tested and no ground or short circuit was found. He stated that the time release requires 2 minutes before the route can be changed from one road to the other. It is impossible for the signals on both lines to display proceed at the same time. A general inspection of the interlocking was made on April 5, at which time it was in good condition, and no trouble had been experienced since that time.

Signal Engineer Grundy, of the K. C. S., stated that the K. C. S. maintains the interlocking involved. He arrived at the scene about 12 hours after the accident occurred. All home signals were displaying stop and the relays were in position for these signals to be at stop. Approach signal 1225 also was at stop, the polar contacts of the controlling relay were

in position for displaying an approach indication and the neutral contacts of the polar control relay for this signal were open. These neutral contacts were open because the battery that supplied energy to the control relay had been demolished in the accident. He applied a battery to the control wires of both the approach and the home signals and found that the signal mechanisms operated normally and without undue friction. He then tested and checked for grounds and crosses in the line wires, control wires, signal mechanisms and cable drops. All these devices were free from defects and clear of grounds. He tested the lock circuits and found that they functioned as intended. A check of the relays for pick-up and drop-away was made and the relays were found to be within the prescribed limits. He observed sand on the K. C. S. rail at a point about halfway between the home signal and the crossing.

The statement of Signal Supervisor Lord added nothing of importance.

Traveling Engineer Bryant stated that, in his opinion, a service application of the air brakes made at the approach signal would stop the train involved, moving from 60 to 65 miles per hour, short of the home signal.

Records of the K. C. S. indicate that Engineman Guinn had been given a semiannual physical examination on January 28, 1941, and no unusual condition was found.

#### Observations of the Commission's Inspectors

The Commission's inspectors observed that the lights of home signal 1229 could be seen from a point 5,037 feet north of the signal, and an excellent view of the home-signal lights could be had from the approach signal, a distance of 2,707 feet. These observations were made on a moonlight night when conditions were approximately the same as on the night of the accident.

The inspectors witnessed the tests of the signal equipment and the results were as stated by the signal engineer. No records of tests of the automatic interlocking were on file and no forms for recording tests had been provided by the carrier, as required by the Commission's order of April 13, 1939, prescribing rules, standards and instructions for installation, inspection, maintenance and repair of interlocking and other signal systems.

### Discussion

According to the evidence, the M. P. home signal displayed proceed and the M. P. train was moving over the crossing at a speed of 20 miles per hour when the twenty-ninth car of its train was struck by the K. C. S. train, which approached the crossing at a speed of about 60 miles per hour and was moving at a speed of 20 to 30 miles per hour at the time of the accident.

The automatic interlocking by which the crossing was protected was so arranged that the first train to enter its approach circuit would receive a signal indication for movement over the crossing and the home signals on the other line would remain at stop until the first train had completed its movement over the crossing. Since it would take about 2.5 minutes for the engine of the M. P. train to move at a speed of 20 miles per hour from the north end of its approach circuit to the point it had reached at the time of the accident, a distance of 0.8 mile, and since it would take about 0.5 minute for the K. C. S. train to move at a speed of 60 miles per hour from the north end of its approach circuit to the approach signal, a distance of 0.5 mile, and about 0.9 minute to move at an average speed of 40 miles per hour from the approach signal to the crossing, a distance of 0.6 mile, it follows that the M. P. train entered its track circuit at least 1 minute before the K. C. S. train entered its own track circuit; therefore, the K. C. S. train should have received an approach indication at the approach signal and a stop indication at the home signal.

When the engine of the M. P. train was closely approaching the crossing the engineman of that train observed the northward K. C. S. home signal displaying stop and the fireman observed the southward K. C. S. home signal displaying stop. The fireman of the K. C. S. train did not see the indications of the signals involved because he was in the rear part of the locomotive. Apparently the engineman saw the stop indication displayed by the home signal as the brakes on the K. C. S. train were applied in emergency a short distance north of this signal. The brakes on the train had been tested and had functioned properly en route. The engineman had sounded highway crossing whistle signals before the train reached the approach signal. It was moonlight and there was no condition that would obstruct the view ahead. Why the engineman failed to control the speed of his train so that it could be stopped short of the home signal is not known, as he was so badly injured in the accident that he was unable to make a statement during the month following the occurrence of the accident. If the fireman had been in position to observe the interlocking signal indications, it is probable that this accident would have been averted.

Tests made after the accident disclosed no abnormal condition in the line wires, control wires, signal mechanisms and cable drops; the lock circuits functioned as intended. The results of these tests indicate that the interlocking was functioning as intended.

Cause

It is found that this accident was caused by failure properly to control the speed of the Kansas City Southern train in compliance with interlocking signal indications.

Dated at Washington, D.C., this twenty-eighth day of June, 1941.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.