

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3171
CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA
RAILWAY COMPANY
REPORT IN RE ACCIDENT
AT LEVIS, WIS., ON
MARCH 7, 1948

SUMMARY

Railroad: Chicago, Saint Paul, Minneapolis
and Omaha

Date: March 7, 1948

Location: Levis, Wis.

Kind of accident: Side collision

Trains involved: Passenger : Baggage-express

Train numbers: 511 : Extra 515 West

Engine numbers: 510 : 515

Consists: 7 cars : 5 cars

Estimated speeds: 3 m. p. h. : 55 m. p. h.

Operation: Timetable, train orders and automatic
block-signal system

Tracks: Double; tangent; 0.308 percent
descending grade westward

Weather: Clear

Time: 1:30 a. m.

Casualties: 4 injured

Cause: Failure to provide adequate protection
for crossover movement

Recommendation: That the Chicago, Saint Paul,
Minneapolis and Omaha Railway Company
install electric switch-locking
at main-track hand-operated
switches in automatic block-
signal territory

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3171

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

CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA
RAILWAY COMPANY

May 11, 1948

Accident at Levis, Wis., on March 7, 1948, caused by
failure to provide adequate protection for a
crossover movement.

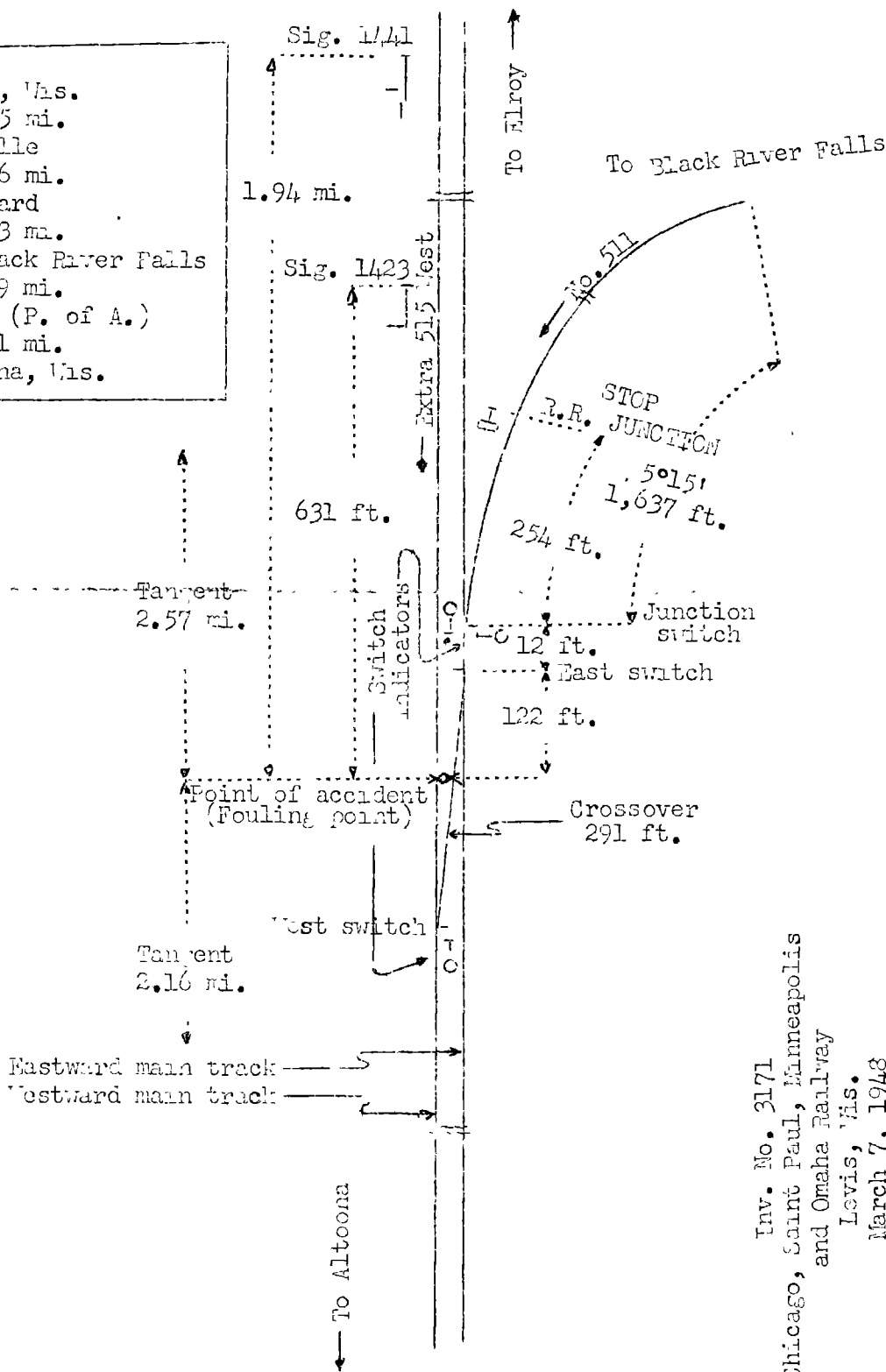
REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On March 7, 1948, there was a side collision between
a passenger train and a baggage-express train on the
Chicago, Saint Paul, Minneapolis and Omaha Railway at
Levis, Wis., which resulted in the injury of four train-
service employees.

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

- o Elroy, Wis. 22.5 mi.
- o Wyeville 26.6 mi.
- o Shepard 3.3 mi.
- o Black River Falls 1.9 mi.
- X Levis (P. of A.) 51.1 mi.
- o Altoona, Wis.



Inv. No. 3171
 Chicago, Saint Paul, Minneapolis
 and Omaha Railway
 Levis, Wis.
 March 7, 1948

Location of Accident and Method of Operation

This accident occurred on that part of the Eastern Division extending between Elroy and Altoona, Wis., 105.4 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. At Sheppard and at Levis, respectively, 49.1 and 54.3 miles west of Elroy, a single-track line 5.2 miles long connects with the eastward main track of the double-track line. The single-track line extends through Black River Falls, located 3.3 miles southwest of Sheppard and 1.9 miles southeast of Levis. Trains are operated over this line by timetable and train orders. There is no station at Levis. The junction switch at Levis is hand-operated, and is opposite a telephone booth. A hand-operated trailing-point crossover 291 feet in length connects the eastward and the westward main tracks at Levis. The east and west switches of the crossover are, respectively, 12 feet and 303 feet west of the junction switch. The accident occurred at the fouling point of the westward main track and the crossover, at a point 122 feet west of the east crossover-switch. The double-track line is tangent throughout a distance of 2.57 miles immediately east of the point of accident and 2.16 miles westward. The grade is 0.308 percent descending westward. From the southeast on the single-track line there is a 5°15' curve to the left extending 1,637 feet to the junction switch.

Automatic signals 1441 and 1423, governing west-bound movements on the westward main track, are, respectively, 1.94 miles and 631 feet east of the point of accident. Signal 1441 is of the two-arm, four-indication, semaphore type, and is continuously lighted. Signal 1423 is of the one-arm, three-indication, semaphore type, and is approach lighted. Switch indicators of the semaphore type are located adjacent to the switchstands of the junction switch and both switches of the crossover. The involved aspects and the corresponding indications and names of the signals and indicators are as follows:

<u>Signal</u>	<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
1441	Green-over-red	PROCEED	CLEAR
1423	Red	STOP; THEN PROCEED IN ACCORDANCE WITH RULE 510 * * *	STOP-AND- PROCEED

Switch indicator	45°	PROCEED AT NOT EXCEEDING MEDIUM SPEED.	CLEAR-MEDIUM
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Switch indicator	Horizontal	STOP.	STOP.
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The controlling circuits of the block signals are so arranged that when a train is occupying the westward main track in the block extending between signal 1423 and the next signal westward, or when either switch of the crossover is lined for movement through the crossover, signal 1441 displays prepare-to-stop-at-next-signal, and signal 1423 displays stop-and-proceed. The controlling circuit of the switch indicator at the east crossover-switch is so arranged that when a train is occupying the westward main track within a distance of 3.19 miles immediately east of the crossover the semaphore arm of the switch indicator is displayed in horizontal position. If the westward main track is unoccupied within the limits of the controlling circuit the semaphore arm of the switch indicator is displayed at an angle of 45 degrees in the upper quadrant. The switch indicator at the junction switch indicates occupancy of the eastward main track.

The switchstand of the junction switch is of the intermediate-stand type, and is provided with two targets and an oil-burning switch lamp. The center of the switch lamp is about 5 feet above the level of the tops of the rails and 7 feet south of the south rail of the eastward main track. The switchstands of the crossover switches are of the low-stand type, located between the eastward and the westward main tracks, and are provided with oil-burning lamps equipped with flared-disc targets. The centers of the switch lamps are 1 foot 8 inches above the level of the tops of the rails. When the crossover switches are lined normally, green lights are displayed. When the junction switch and the crossover switches are lined for movement from the single-track line to the eastward main track and thence through the crossover to the westward main track red lights and red targets are displayed.

A stop sign 3.5 feet long and 1.5 feet wide is located 254 feet east of the junction switch and about 7 feet north of the north rail of the single-track line. This sign is mounted on a mast 7.5 feet above the level of the tops of the rails and bears the words "STOP R.R. JUNCTION" in black letters on a white background.

This carrier's operating rules read in part as follows:

DEFINITIONS.

* * *

Train Register.--A book or form which may be used at designated stations for registering signals displayed, the time of arrival and departure of trains * * *

Medium Speed.--The speed as indicated in division time-table for each diverging main route.

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

11. A train finding a fusee burning on or near its track must stop and extinguish the fusee, and then proceed at restricted speed. * * *

35. The following signals will be used by flagmen.

* * *

Night signals--A red light,
A white light,
Torpedoes and
Fusees.

73. Extra trains are inferior to regular trains.

85. A train must not leave its initial station on any division, * * *, or a junction, * * * until it has been ascertained whether all trains due, which are superior, or of the same class, have arrived or left.

83a. * * *

A train returning to its regular route after having been detoured, must not resume its schedule unless directed by train order to do so.

98. Trains must approach * * * junctions, * * * prepared to stop, unless the switches are properly lined, signals indicate proceed and track is clear.
* * *

99. When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure full protection, placing two torpedoes, and when necessary, in addition, displaying lighted fuses. * * *

* * *

510. When a train is stopped by a block signal on double track, it may proceed when the signal is cleared or if not immediately cleared, may proceed at restricted speed.

513. Both switches of a cross-over must be open before a train or engine starts to make a cross-over movement, and the movement must be completed before either switch is restored to normal position.

514. Where switch indicators are used, the indications displayed do not relieve enginemen and trainmen from protecting their train as required by the rules.

514a. A switch must not be opened to permit a movement to a main track when the semaphore arm is horizontal or the disc is visible in the indicator box at the switch, except under protection as per Rule 99.

While switch is being opened position of indicator should be observed. If it does not show red disc or if semaphore arm does not go to Stop position, it signifies that protecting signals have failed to go to Stop. In such case, or if indicator is out of order, movements must only be made under protection of flagman, as per Rule 99.

515a. A train or engine entering a block between signals must be protected as required by the rules and must proceed at restricted speed.

Timetable special instructions governing movements in this territory provide that first-class trains may enter double track at junction points where train registers are not provided, and may proceed unless otherwise instructed. There is no train register at Levis.

The maximum authorized speed for the passenger train moving through the crossover was 25 miles per hour. The maximum authorized speed for the baggage-express train moving on the westward main track was 80 miles per hour.

Description of Accident

At Elroy the crew of No. 511, a west-bound first-class passenger train, received copies of train order No. 59 addressed to No. 511 and to engine 510, and reading as follows:

Eng 510 run extra Levis to Black River Falls with right over No. 511 and resume schedule as No. 511 at Black River Falls All trains due Levis up to ten twenty 1020 P.M. have passed

No. 511 consisted of engine 510, one baggage car, one passenger-baggage car, two coaches and three sleeping cars, in the order named. The fourth car was of light-weight steel construction, and the remainder of the cars were of conventional heavy steel construction. This train arrived at Levis on the westward main track, backed through the crossover to the single-track line, and then proceeded as Extra 510 East to Black River Falls. No. 511 departed from Black River Falls at 1:18 a. m., 18 minutes late, and stopped at the stop-sign at Levis at 1:27 a. m., 20 minutes late. Soon afterward, this train proceeded from the single-track line to the eastward main track then entered the crossover at the east switch, and was moving through the crossover at an estimated speed of 3 miles per hour when the engine was struck by Extra 515 West.

At Elroy the crew of Extra 515 West, a west-bound baggage-express train, received copies of a clearance form reading in part as follows:

* * *

Last train ahead, No. 511
left here at 12:08 a. m.

* * *

Extra 515 West consisted of engine 515, four express-refrigerator cars and one passenger-baggage car. The first four cars were of steel underframe construction, and the fifth car was of wooden construction. This train departed from Elroy at 12:36 a. m., passed Wyeville, the last open office, 31.8 miles east of Levis, at 1:04 a. m., passed signal 1441, which displayed proceed, passed signal 1423, which displayed stop-and-proceed, and while moving at an estimated speed of 55 miles per hour it collided with No. 511.

The engine of No. 511 was derailed and stopped on its left side on the south rail of the eastward main track and parallel to it, with its front end 116 feet west of the point of accident. The tender, remaining coupled, stopped practically upright and in line with the engine. The main engine frame was broken, the cab was demolished and the right sides of the engine and the tender were considerably damaged. The front truck of the first car of No. 511 was derailed. A separation occurred between the fifth and sixth cars as a result of the front coupler of the sixth car becoming broken. The first and sixth cars were slightly damaged. The engine, the tender and all cars of Extra 515 West were derailed. The engine and the tender, remaining coupled, stopped on their right sides, north of the westward main track and at an angle of about 10 degrees to it, with the front end of the engine on the roadbed and 440 feet west of the point of accident. The left cylinder was torn off, and the cab and the left sides of the engine and the tender were badly damaged. The first car stopped on its right side, at the rear of the tender, about 25 feet north of the westward main track and at an angle of 20 degrees to it. The second to fifth cars, inclusive, remained coupled and stopped practically upright, about 5 feet north of the westward main track and parallel to it, with the front of the second car and the rear of the fifth car, respectively, 323 and 115 feet west of the point of accident. The third car was considerably damaged, and the remainder of the cars were badly damaged.

The engineer and the fireman of No. 511, and the engineer and the fireman of Extra 515 West were injured.

The weather was clear at the time of the accident, which occurred about 1:30 a. m.

Discussion

The rules and timetable special instructions governing operation on this line require that, where switch indicators are used in conjunction with hand-operated switches in automatic block-signal territory, the indication displayed by such indicators must be observed before junction switches or crossover switches are opened. If a switch indicator displays stop, the switch in that circuit must not be opened until after adequate flag protection has been provided. When a switch indicator displays proceed-at-medium-speed, the switches may be opened and crossover movements may be made under flag protection. In addition, both switches of a crossover must be lined for the movement before a train enters the crossover. All employees involved so understood.

No. 511, a west-bound first-class train, backed through the crossover at Levis, entered the single-track line and proceeded to Black River Falls. This train departed from Black River Falls about 1:18 a. m. and stopped at the stop-sign located near the junction switch at Levis about 1:27 a. m. Soon afterward, this train entered the crossover connecting the eastward and the westward main tracks and the engine was struck by Extra 515 West at the fouling point of the westward main track and the crossover.

When No. 511 stopped at the stop-sign the enginemen were on the engine, and the conductor was on the front platform of the fourth car. The flagman placed a lighted red fusee on the westward main track at a point about 450 feet east of the point where the accident occurred, then proceeded to the junction switch. The front brakeman proceeded to the west crossover-switch. The flagman said that the indicators at the junction switch and at the east crossover-switch displayed proceed-at-medium-speed, and he lined the junction switch for movement from the single-track line to the eastward main track, then lined the east crossover switch for entry to the crossover. He said that immediately after he lined the switches their respective indicators changed to display stop. Before he lined the switches he saw the reflection of a headlight of a west-bound train at a considerable distance eastward, but thought the action of lining the switches immediately would provide automatic block-signal protection, as he thought the approaching train was east of signal 1441. Immediately after the junction switch and the east crossover-switch were lined, No. 511 proceeded at a slow rate of speed and entered the crossover. At this time the flagman saw that the train approaching on the westward main track was not preparing to stop clear of the crossover, and gave a slow-speed lantern signal to the engineer of No. 511. However, No. 511 continued to proceed and fouled the westward main track. The front brakeman said that before he arrived at the west crossover-switch, No. 511 had entered the crossover, and the accident occurred before he could take any action to stop the movement of either train. After the accident the junction switch and the east crossover-switch were in position for movement through the crossover, but the west crossover switch was in normal position. The engineer of No. 511 said that because of excessive leakage of steam at the steam-heat couplers between the tender and the first car, he did not see Extra 515 West approaching until his engine had fouled the westward main track. He said that all the switches involved in the movement were properly lined before No. 511 started to move westward from the stop sign, and that just before the accident

occurred the front brakeman lined the west crossover-switch to normal position. Then the engineer placed the brake valve in emergency position. The fireman said that all switches involved were properly lined for the movement of No. 511 through the crossover, and that the flagman gave a proceed signal before the movement started.

As Extra 515 West was approaching Lewis the speed was about 60 miles per hour, and the headlight was lighted brightly. The enginemen were maintaining a lookout ahead from their respective positions in the cab, and the members of the train crew were in the rear car. Signals 1441 and 1423, located 1.94 miles and 631 feet east of the point of accident, displayed proceed, and the engineer called the indications. When the engine was about 700 feet east of signal 1423 the enginemen saw, simultaneously, a fusee burning on the westward main track at a distance of about 1,100 feet ahead of the engine, signal 1423 change to display stop-and-proceed, and stop signals being given with a lighted white lantern. The engineer immediately placed the brake valve in emergency position, but the accident occurred before the speed of the train was materially reduced. Under the rules, No. 511 was required to provide flag protection for the crossover movement a distance sufficient to stop a west-bound train on the westward main track short of the crossover. However, the members of the crew of No. 511 said that the protection which they provided was in accordance with customary practice.

The controlling circuit of the switch indicator at the east switch of the crossover at Lewis extends to a point 3.19 miles eastward on the westward main track, and is so arranged, that if the westward main track is occupied within that distance, the indicator at the east crossover-switch displays stop. Considering the statements of the crew of No. 511 that the indicator displayed proceed-at-medium speed, that the switches were lined for movement before No. 511 entered the crossover, and that the average speed of Extra 515 West was 60 miles per hour, signal 1441 should have displayed prepare-to-stop-at-next-signal, and signal 1423 should have displayed stop-and-proceed for a period of at least one minute before Extra 515 West passed signal 1441. Tests were made of the signal apparatus, the indicators, and the controlling circuits after the accident, and no defective condition was found. Since signal 1423 changed to display stop when Extra 515 West was a short distance east of this signal, it is apparent that the east crossover-switch was opened at that time, and that the switch indicator should have displayed stop at the time the switch was opened. If the switches involved had been provided with electric switch-locking, it would not have been possible to operate the switches to permit movement from the single-track line and through the crossover when a train was closely approaching, as in this case.

Cause

It is found that this accident was caused by failure to provide adequate protection for a crossover movement.

Recommendation

It is recommended that the Chicago, Saint Paul, Minneapolis and Omaha Railway Company install electric switch-locking at main-track hand-operated switches in automatic block-signal territory.

Dated at Washington, D. C., this eleventh day of May, 1948.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.