INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 3162

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT IOWA CITY, IOWA, ON

FEBRUARY 1, 1948

SUMMARY

Railroad:	Chicago, Rock Island and Pacific	
Date:	February 1, 1948	
Location:	Iowa City, Iowa	
Kind of accident:	Rear-end collision	
Trains involved:	Freight	: Passenger
Train numbers:	Extra 5014 West	: 7
Engine numbers:	5014	: Diesel-electric units 635 and 621
Consists:	40 cars, caboose	: 10 cars
Estimated speeds:	10 m. p. h.	: 20 m. p. h.
Operation:	Timetable, train orders and automatic block-signal system	
Tracks:	Double; 1°30' curve; 0.33 percent descending grade westward	
Weather:	Clear and dusk	
Time:	5:58 p. m.	
Casualties:	1 killed; 20 injured	
Cause:	Freight train without authority backing into block occupied by following passenger train	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3162

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

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY

March 24, 1948

Accident at Iowa City, Iowa, on February 1, 1948, caused by a freight train without authority backing into a block occupied by a following passenger train.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On February 1, 1948, there was a rear-end collision between a freight train and a passenger train on the Chicago, Rock Island and Pacific Railroad at Iowa City, Iowa, which resulted in the death of 1 train-service employee, and the injury of 14 passengers, 3 railway-mail clerks, 1 express messenger and 2 train-service employees. This accident was investigated in conjunction with a representative of the Iowa State Commerce Commission.

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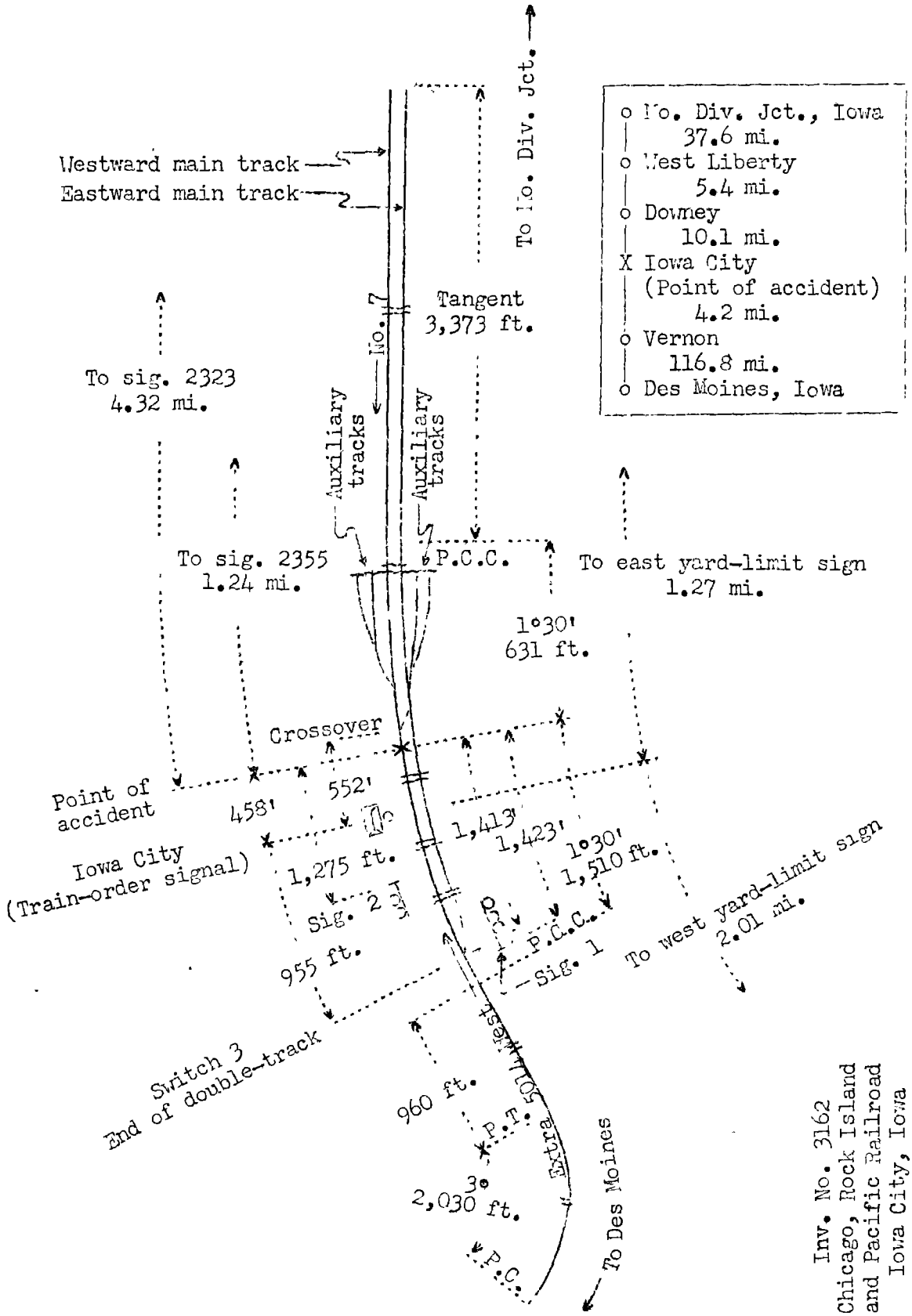
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 3162
Chicago, Rock Island
and Pacific Railroad
Iowa City, Iowa
February 1, 1948

Location of Accident and Method of Operation

This accident occurred on that part of the Des Moines Division extending between Mo. Div. Jct., Davenport, and Des Moines, Iowa, 174.1 miles. Between Mo. Div. Jct. and Iowa City, 53.1 miles, this is a double-track line over which trains moving with the current of traffic are operated by timetable, train orders and an automatic block-signal system, and between Iowa City and Altoona, 110.1 miles west of Iowa City, a single-track line over which trains are operated by timetable, train orders and an automatic block-signal system. The switch at the west end of the double-track at Iowa City, designated as switch 3, is within yard and interlocking limits. Switch 3 is 955 feet west of the station, and is controlled from an interlocking machine in the station. A hand-operated trailing-point crossover 200 feet long connects the eastward and the westward main tracks. The west switch of this crossover is 552 feet east of the station. Between points 2,793 and 803 feet east of the station, auxiliary tracks parallel the main tracks on the north and the south. The accident occurred on the westward main track at a point 458 feet east of the station and 1,413 feet east of switch 3. From the east there are, in succession, a tangent 3,373 feet in length and a compound curve to the left, having a maximum curvature of 1°30', 631 feet to the point of accident and 1,510 feet westward. From the west there are, in succession, a 3° curve to the left 2,030 feet in length, a tangent 960 feet and the curve on which the accident occurred. The grade is 0.33 percent descending westward.

Automatic signals 2323 and 2355, governing west-bound movements on the westward main track, interlocking signal 2, governing west-bound movements from the westward main track through switch 3 to the single-track line, and interlocking signal 1, governing east-bound movements from the single-track line to either the westward or the eastward main track, are, respectively, 4.32 miles east, 1.24 miles east, 1,275 feet west and 1,423 feet west of the point of accident. These signals are of the color-light type. Signals 2323 and 2355 are approach lighted, and signals 2 and 1 are continuously lighted. The involved aspects and corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
2323 and 2355	Yellow	Proceed, immediately reducing to Medium Speed, or slower if necessary, prepared to stop before leading wheels pass the next signal.	APPROACH SIGNAL
2	Green-over-red	PROCEED	CLEAR SIGNAL
	Red-over-red	STOP * * *	STOP SIGNAL
1	Red-over-red-over-red	STOP * * *	STOP SIGNAL

The train-order signal at Iowa City is of the upper-quadrant, semaphore type, and is mounted on a mast located on the north side of the westward main track and opposite the station. The involved aspect and corresponding indication and name of the signal are as follows:

	Aspect	Indication	Name
For west-bound trains:	Horizontal, red	STOP-ORDERS FOR TRAIN.	STOP TRAIN ORDER SIGNAL * * *

The interlocking at Iowa City consists of an electrical machine having 4 working levers in a 4-lever frame. Time, route and indication locking are provided. An illuminated track diagram is provided, and is so arranged that a green light is displayed to indicate occupancy of the westward main track between signal 2323 and signal 2, and a red light is displayed to indicate occupancy of the tracks between signals 2 and 1. The controlling circuits of the automatic signals and the interlocking signals are so arranged that when the block extending between signal 2355 and signal 2 is occupied, signal 2323 displays proceed-preparing-to-stop-at-next-signal, and signal 2355 displays stop-then-proceed. When the block extending westward from signal 2 is occupied, or if signal 2 displays stop, signal 2355 displays proceed-preparing-to-stop-at-next-signal, and signal 2 displays stop.

The eastward and the westward yard-limit signs are located, respectively, 1.27 miles east and 2.01 miles west of the station.

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

DEFINITIONS.

* * *

Low Speed:- A speed that will permit stopping short of another train or an obstruction, but not exceeding 15 miles per hour.

Medium Speed:- A speed not exceeding one-half authorized speed, but not exceeding 30 miles per hour.

9. * * * when day signals cannot be plainly seen, night signals must be used in addition.

* * *

11. A train finding a fusee burning on or near its track must stop and extinguish the fusee. Train may then proceed at low speed.

14. Engine Whistle Signals.

NOTE.--The signals prescribed are illustrated by "o" for short sounds; "___" for longer sounds.
* * *

Sound.	Indication.
* * *	
(h) o o o	When standing, back. * * *

* * *

15. The explosion of two torpedoes is a signal to proceed at low speed. * * *

* * *

19. The following signals will be displayed to the rear of every train, as markers, to indicate the rear of the train:

Lights * * * as markers, showing green to the front and side and red to the rear.

35. The following signals will be used by flagmen:

* * *

Night signals (A red light,
(Torpedoes and
(Fusees.

73. Extra trains are inferior to regular trains.

86. In automatic block signal territory, unless otherwise provided, an inferior train must clear a first class train or train of superior right in the same direction so as to avoid giving a restrictive indication to the following train.

* * *

93. Within yard limits the main track may be used, clearing first-class trains as herein prescribed:

In automatic block signal territory, unless otherwise provided, second and inferior class, extra trains and engines, must clear first-class trains in same direction so as to avoid giving a restrictive indication to the following train.

* * *

Within yard limits the main track may be used without protecting against second and inferior class, extra trains and engines.

* * *

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 fusees.

When recalled and safety to the train will permit, he may return.

When the conditions require, he will leave the torpedoes and a lighted fusee.

* * *

221 (b). A train must not pass the train order signal while at "stop" indication, except to take fuel, water, or to perform station work within station limits, and will protect when required, * * *

* * *

515. A train or engine having passed beyond the limits of a block must not back into that block, except under protection as prescribed by Rule 93, Rule 99 or train order.

607. In automatic block signal territory, where automatic block signals are used in conjunction with interlocking signals, such signals will govern the use of the blocks as well as the use of the routes through the interlocking, and automatic block signal rules in addition to interlocking rules, are in effect.

663. Trains or engines must not pass an interlocking signal indicating Stop without receiving hand signals, and must send a man ahead, provided they cannot see that the track is properly lined; the movement must then be made at low speed.

Timetable special instructions read in part as follows:

Second class, extra trains and engines must clear the time of Nos. 7 * * * not less than 10 minutes.

The maximum authorized speed for the freight train in forward motion was 50 miles per hour and 25 miles per hour in backward motion. The maximum authorized speed for the passenger train was 85 miles per hour.

Description of Accident

Extra 5014 West, a west-bound freight train, consisting of engine 5014, 40 cars and a caboose, departed from West Liberty, 15.5 miles east of Iowa City, at 5:17 p. m., and stopped on the westward main track about 3,000 feet east of

the station at Iowa City at 5:38 p. m., because of an undesired brake application. About 5:41 p. m. this train proceeded westward, passed the train-order signal, which displayed stop-orders-for-train, passed signal 2, which displayed proceed, entered the single-track line at switch 3 and stopped at 5:53 p. m., with the rear end standing immediately west of signal 1. About 2 minutes later, this train started an eastward movement, passed signal 1, which displayed stop, reentered the westward main track at switch 3, and while moving at an estimated speed of 10 miles per hour the rear end collided with No. 7 at a point 1,423 feet east of signal 1.

No. 7, a west-bound first-class passenger train, consisted of Diesel-electric units 635 and 621, coupled in multiple control, one baggage-mail car, one express car, three coaches, one club car, one sleeping car, one dining car, one sleeping car and one parlor-observation car, in the order named. All cars were of lightweight steel construction. This train passed West Liberty at 5:43 p. m., 8 minutes late, passed signals 2323 and 2355, which displayed proceed-prepared-to-stop-at-next-signal, and while moving at an estimated speed of 20 miles per hour it struck Extra 5014 West at a point 1.24 miles west of signal 2355.

The caboose and the rear nine cars of Extra 5014 West were derailed. The caboose, the second rear car and the seventh rear car were demolished. Of the remainder of the derailed cars, five were badly damaged and two were slightly damaged. The first unit of the Diesel-electric engine of No. 7 was derailed and stopped at an angle of 45 degrees to the main tracks and leaned to the north at an angle of 20 degrees, with the front end 25 feet west of the point of collision and 38 feet north of the centerline of the westward main track. The front ends, the fuel tanks and the left sides of both units were considerably damaged. The front truck of the first unit was torn loose and was pushed backward under the unit about 12 feet. Two pairs of wheels of the front truck and one wheel of the rear truck of the second car were derailed. No other unit of No. 7 was derailed, and no separation of the couplers occurred. The couplers were of the tightlock type.

The Diesel-electric units were provided with 24-RL brake equipment, and the cars of the train with HSC brake equipment. The train-brake system is arranged for either electro-pneumatic straight air-brake control, or automatic air-brake control. The brake valve is so arranged that an

emergency application of the train-brake system can be obtained by moving the brake valve to the extreme right of the quadrant, regardless of which brake system is in use. A safety-control feature is so arranged that when no pressure is exerted on either the foot pedal or the automatic brake-valve handle, a service application of the brakes will occur, unless a 30-pound pressure exists in the pipe to the relay valve.

The conductor of Extra 5014 West was killed. The fireman and the front brakeman of No. 7 were injured.

The weather was clear and it was dusk at the time of the accident, which occurred at 5:58 p. m.

Discussion

The rules and timetable special instructions governing operation on this line provide that an inferior west-bound train must be clear of the main track not less than 10 minutes before the time No. 7, a west-bound first-class train, is due to leave the next station in the rear where time is shown. In automatic block-signal territory a train having passed beyond the limits of a block must not back into that block, unless authorized by train order to do so, or under proper protection. A train must not pass an interlocking signal indicating stop unless it receives a hand signal.

No. 7 was due to leave West Liberty, 15.5 miles east of Iowa City, at 5:35 p. m., Downey, 10.1 miles east of Iowa City, at 5:40 p. m., and Iowa City at 5:50 p. m. There is a siding at West Liberty. There is no siding at Downey or Iowa City.

Extra 5014 West, a west-bound freight train moving on the westward main track, passed West Liberty at 5:17 p. m. and stopped about 3,000 feet east of the station at Iowa City about 5:38 p. m., because of an undesired brake application resulting from a defective brake-pipe branch-pipe on the thirty-eighth car. About 3 minutes later, after this brake was cut out, Extra 5014 West proceeded westward, passed the train-order signal, which displayed stop-orders-for-train, passed signal 2, which displayed proceed, entered the single-track line at switch 3 and stopped about 5:53 p. m., with the rear end standing immediately west of switch 3 and signal 1. Then this train proceeded eastward, passed signal 1, which displayed stop, reentered the westward main track, and was moving eastward at a speed of about 10 miles per hour when the rear end was struck by No. 7 at 5:58 p. m., at a point 1,423 feet east of signal 1 and 1.24 miles west of signal 2355.

No. 7 passed West Liberty at 5:43 p. m., 8 minutes late. No train order restricting the authority of No. 7 to proceed at maximum authorized speed between West Liberty and Iowa City had been issued. As this train was approaching Iowa City the speed was about 25 miles per hour, in compliance with the proceed-prepared-to-stop-at-next-signal indications displayed by signals 2323 and 2355. The enginemen were maintaining a lookout ahead from their respective positions in the control compartment of the first Diesel-electric unit. The first these employees knew of anything being wrong was when their engine was about 500 feet east of the point where the accident occurred and they heard the explosion of two torpedoes and saw, simultaneously, stop signals being given with a lighted fusee and lighted marker lamps a short distance ahead of their engine. Then the engineer moved the brake valve to emergency position, but the collision occurred before the train could be stopped. The brakes of No. 7 had been tested and had functioned properly en route.

The investigation disclosed that after the operator at West Liberty reported to the train dispatcher that Extra 5014 West had passed that station at 5:17 p. m., the train dispatcher issued to the operator at Iowa City train order No. 111, addressed to No. 7 and Extra 5014 West, reading as follows:

> No. 7 diesel 635 wait at Iowa City
> until 556 PM Vernon 601 PM

There is a siding at Vernon, 4.2 miles west of Iowa City. Under the provisions of this train order, Extra 5014 West was authorized to proceed from Iowa City to Vernon, if it could be into clear at Vernon not later than 5:46 p. m. When the operator at Iowa City observed by the track-diagram approach indicator that Extra 5014 West had entered the westward approach circuit, he lined the route for this train to proceed from the westward main track through switch 5 to the single-track line. The train-order signal was displayed for Extra 5014 West, and the operator was on the station platform preparing to deliver train order No. 111 to the crew of Extra 5014 West when he observed by the reflection of the headlight that this train had stopped at a point some distance east of the station, and he thought that Extra 5014 West had entered an auxiliary track in that vicinity to clear for No. 7. Then he returned to the office, and was not aware that Extra 5014 West was proceeding westward until the engine passed the train-order signal. Then the operator delivered all copies of the order to the conductor as the caboose passed the office. The operator said that he received no request from any member of the crew to line the route for Extra 5014 West to proceed

eastward from the single-track line through switch 3 to either the eastward or the westward main track, and he did not line the route for such movement, or change the position of any lever between the time Extra 5014 West approached from the east and the time of the accident. The first the operator knew of anything being wrong was when the caboose of Extra 5014 West passed the station moving eastward on the westward main track. The agent was in the vicinity of the station and he said he observed the conductor giving back-up signals with a lighted white lantern before the back-up movement was started. The agent said that when the caboose passed the station the conductor left the rear platform and proceeded into the caboose, but the agent did not observe any action of the brakes until the time of the collision. The caboose was equipped with a conductor's valve located in the cupola. The conductor was killed in the accident. When examined after the accident the conductor's valve was in open position.

The engineer of Extra 5014 West said that when his train stopped east of the station at Iowa City he sounded the engine-whistle signal for the flagman to provide protection at that point, and did not sound the whistle signal for the flagman to return. Because the auxiliary tracks east of the station were blocked with cars, the engineer intended to use the eastward main track for his train to clear for No. 7. To avoid excessive delay to No. 7, the engineer intended to make this movement at switch 3 instead of using the hand-operated crossover east of the station. The engineer thought the flagman would provide protection for such movement. Soon after Extra 5014 West stopped west of signal 1, the front brakeman saw back-up lantern signals being given from the vicinity of the rear of the train, and he relayed this information to the engineer. The enginemen and the front brakeman thought the route was lined for their train to enter the eastward main track at switch 3 but, because of track curvature, the indication displayed by signal 1 could not be seen from the front of the train. The first these employees knew of anything being wrong was when the brakes became applied in emergency. The engineer said that he did not stop his train short of the train-order signal to obtain orders and a clearance, because no east-bound first-class schedule was overdue at Iowa City and he intended to operate in accordance with the provisions of the yard-limit rule in entering single track. The flagman said that after the conductor released the brake on the thirty-eighth car the conductor instructed the flagman to

return to the caboose. The flagman did not leave a burning fusee or place torpedoes at this point. Later, the conductor instructed him to alight at a point about 900 feet east of the station to provide flag protection against No. 7, then, if Extra 5014 West proceeded westward from Iowa City, the flagman should board the engine of No. 7 and proceed to the point where his train cleared for No. 7. The flagman immediately placed two torpedoes on the right rail of the westward main track, and when he saw the reflection of the headlight of No. 7 he gave stop signals with a lighted fusee. He was not aware that his train was moving eastward on the westward main track until immediately before the collision occurred.

Cause

It is found that this accident was caused by a freight train without authority backing into a block occupied by a following passenger train.

Dated at Washington, D. C., this twenty-fourth day of March, 1948.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.