

**RAILROAD ACCIDENT INVESTIGATION**

**Report No 4039**

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UNION PACIFIC RAILROAD COMPANY

RAWLINS, WYO

DECEMBER 10, 1964

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**INTERSTATE COMMERCE COMMISSION**

**Washington**

## SUMMARY

DATE	December 10, 1964	
RAILROAD	Union Pacific	
LOCATION	Rawlins, Wyo	
KIND OF ACCIDENT	Rear-end collisions	
EQUIPMENT INVOLVED	3 track motorcars, 1 push car	Passenger train
TRAIN NUMBER		10
LOCOMOTIVE NUMBERS		Diesel-electric units 927, 937B, 973B, 960
CONSIST		13 cars
SPEEDS	Slow or standing	75-82 m p h
OPERATION	Signal indications	
TRACK	Double, 1°00' curve, 0.55 percent descending grade eastward	
WEATHER	Clear	
TIME	3:40 p.m.	
CASUALTIES	3 killed, 3 injured	
CAUSE	Failure of the flagman to provide adequate protection for associated equipment of the rail defect detector operation	
RECOMMENDATION	That the Union Pacific Railroad Company immediately take such action as necessary to insure full protection for employees and equipment engaged in rail defect-detector operations	

**INTERSTATE COMMERCE COMMISSION****RAILROAD SAFETY AND SERVICE BOARD**

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**RAILROAD ACCIDENT INVESTIGATION****REPORT NO 4039**

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**UNION PACIFIC RAILROAD COMPANY****DECEMBER 10, 1964****SYNOPSIS**

**An eastbound passenger train on the Union Pacific Railroad struck four track cars of a maintenance-of-way track force near Rawlins, Wyo. December 10, 1964. Three trackmen were killed and three others were injured.**

**The accident was caused by failure of the flagman to provide adequate protection for associated equipment of the rail defect-detector operation.**

**Location and Method of Operation**

The accident occurred on that part of the Wyoming Division extending between Green River and Laramie, Wyo., a distance of 251 miles. This is a double-track line over which trains moving with the current of traffic operate by signal indications of automatic block-signal and cab-signal systems.

The initial point of collision was on the eastward main track 4.3 miles west of Rawlins. A second and third collision occurred on the eastward main track, 2,046 and 2,058 feet east of the first collision.

A siding parallels the eastward main track on the south at Rawlins. The west siding-switch is 1.9 miles west of the station.

Signals 6868, 6856, and 6844, governing eastbound movements on the eastward main track, are 175 feet west, 1.1 miles east and 2.4 miles east of the first collision point, respectively. A track occupancy indicator is attached to the mast of signal 6868. It indicates whether the eastward main track is occupied at any point 4.2 miles westward.

In the accident area, the main tracks are in a cut with walls about 33 feet high. Because of this cut and track curvature, the view between track cars at the second and third collision points and an approaching eastbound train is materially restricted. The view between a track car at the first collision point and an approaching eastbound train is partially restricted because of track curvature, cuts, and rolling terrain.

Details concerning the tracks, signals, carrier's operating and maintenance-of-way rules, Wyoming Division Bulletin Order No. 1970, train and track cars involved, damages, and other factors are provided in the appendix.

### **Description and Discussion**

At 7:00 a.m. on the day of the accident, a conductor-pilot and a brakeman reported on duty at Wamsutter, 92.8 miles east of Green River, for service with rail-defect detector car 128. At the same time, a conductor-pilot reported on duty at Creston, 12.2 miles east of Wamsutter, for service with an on-track self-propelled maintenance-of-way crane, which was to be operated in conjunction with the detector car. The detector car and crane were to be operated as eastbound trains, as Extra SRS 128 East and Extra MW 18 East, respectively. The brakeman was assigned as flagman for both trains. Sperry Rail Service employees and a maintenance-of-way employee of the carrier operated the detector car and the crane, respectively.

The detector car left Wamsutter shortly after 7:00 a.m. and, before leaving, the conductor-pilot and brakeman received a copy of a line-up of train movements, which read in part as follows:

*\* \* \* C&E Extra SRS 128 and MW 18 East \* \* \**  
*Clear all first class trains on time*  
*\* \* \**

The detector car departed from Wamsutter on the eastward main track and, soon thereafter, stopped at Creston, where it met the self-propelled crane, 6 track cars and a track force consisting

of a general track foreman, 4 track foremen, 18 trackmen, 1 crane operator, and 1 signal maintainer. While at Creston, both conductor-pilots received copies of a second line-up, which contained no information pertinent to this investigation.

The detector car left Creston about 8:00 a.m. and proceeded eastward at slow speed with its equipment in operation to detect defects in the rails of the eastward main track. It was followed at varying distances by the crane towing two push cars loaded with rails, a track motorcar towing a push car loaded with maintenance-of-way equipment, a track motorcar operated by the signal maintainer, and a track motorcar operated by one of the trackmen. The last track motorcar was used to transport the flagman assigned to protect the detector car, crane and associated track cars against following trains. The detector car, crane, track cars, and track force moved slowly eastward, detecting and replacing defective rails, as described in the appendix. At times, the detector car was 4 to 5 miles ahead of the track motorcar with the flagman.

According to his statements, the flagman was unfamiliar with the carrier's maintenance-of-way rules governing flag protection required for track forces and track cars. He did not receive any specific instructions concerning his flagging duties on the day of the accident, and considered that he was required to provide protection for only the detector car and crane. It was his understanding that he was required to stop all following trains to warn the enginemen about the detector car and crane ahead.

About 1:45 p.m., while the detector car was stopped at Daley's Ranch and the crane at Riner, respectively 9.3 and 13.6 miles west of the first collision point, the conductor-pilots received another line-up, which read in part as follows:

\* \* \*

*NO 10 DALEY'S RANCH      3:35 PM*

\* \* \*

This informed both conductor-pilots it was anticipated No. 10, an eastbound first-class passenger train, would pass Daley's Ranch at 3:35 p.m., approximately 55 minutes late. One of the conductor-pilots informed the general track foreman about this line-up. Neither conductor-pilot, however, informed the flagman about the contents of the line-up, because the flagman was stationed a considerable distance west of both the detector car and crane at this time and there was no available means of communication.

After leaving Daley's Ranch, the detector car passed signal 6868 and detected two defective rails in that portion of a curve and cut 3.9 miles west of Rawlins. Soon afterward, the crane towing two push cars also passed signal 6868 and trackmen started to replace the defective rails.

In the meantime, the detector car proceeded toward Rawlins to clear the eastward main track for No. 10. It entered the Rawlins siding at the west switch and cleared No. 10 at 3:22 p.m. After replacing the two defective rails, the crane with two push cars also proceeded to Rawlins, entered the siding there at the west switch, and cleared the eastward main track at 3:35 p.m. The conductor-pilots left the west siding-switch open and remained near it with the general track foreman to wait

for the remaining equipment of the track force to enter the siding and also clear the track for No 10

Soon after the crane with two push cars left the cut and curve, trackmen secured the two newly laid rails in place and the signal maintainer began to install bond wires at the joints of these rails. About 3 40 p m , while pushing his track motorcar to the last rail joint to be bonded, the signal maintainer heard a locomotive horn sounding to the west. He saw No 10 closely approaching at high speed on the eastward main track, and ran to safety. Moments later, No 10 struck his track motorcar, 2,221 feet east of signal 6868.

The train then struck the track motorcar with push car 12 feet farther eastward, killing three of the trackmen and injuring three other trackmen. None of the track force working with the track car and push car saw or heard No 10 approaching until a moment or two before the collision.

About 30 minutes before the accident, while the crane was replacing the two defective rails in the cut and curve, the track motorcar with the trackman and flagman moved eastward beyond signal 6868 and stopped 150 feet past the signal. The trackman, with the flagman's assistance, then attached a shunt wire to the rails of the eastward main track near the track motorcar intending to cause signal 6868 to display a Stop-and-Proceed aspect whether or not its block was occupied during the approach of any following eastbound train. After attaching the wire to the rails, the flagman proceeded to the top of the cut to observe the progress of the track force ahead.

Before assisting the trackman to attach the shunt wire to the rails, the flagman noticed that the backlight of signal 6868 was illuminated, indicating to him that the signal was displaying a Stop-and-Proceed aspect and that the crane with two push cars had not yet moved eastward from the block of this signal. He stated that he did not again look at the signal before the accident, and that he did not at any time look at the track occupancy indicator attached to the signal mast to determine whether an eastbound train was approaching. He also stated that he did not rely on the shunt wire to provide protection against following trains, and that he remained near the track motorcar with flagman's signals to provide protection for the detector car and crane against following trains moving at restricted speed.

According to his statements, about 30 minutes after stopping a short distance east of signal 6868, the flagman saw the headlight of No 10 approaching at fast speed two to three miles distant. He stated that he immediately started to give stop signals with a lighted fusee and a red flag, but the train entered a vertical curve about this time and descended from his view. He said the train re-entered his view while moving on an ascending grade approximately one mile distant and he then heard its locomotive horn sound an acknowledgment of the stop signals given with the fusee and red flag. A few seconds later, the flagman realized that because of its speed, No 10 could not stop short of the cut and curve where the crane had replaced the two defective rails. He called a warning to the trackman, who promptly ran to the eastward main track and started forward on the track motorcar to warn the trackmen and signal maintainer ahead about the approaching train. However, after moving only a few feet, the trackman heard the flagman warn him to get off the track motorcar. He jumped from the slowly moving track car just before No 10 struck it, 175 feet east of signal 6868 and 4 3 miles west of the Rawlins station. The train continued eastward at diminishing speed and, a few seconds later, struck the signal maintainer's track motorcar and the trackmotorcar with push car.

The general track foreman and the conductor-pilots of the detector car and crane were standing near the Rawlins west siding-switch at the time of the accident. They were unaware of anything being wrong before No. 10 struck the track cars.

No. 10, consisting of 4 diesel-electric units and 13 cars, left Green River at 1:55 p.m. and passed Wamsutter at 3:14 p.m., 1 hour 10 minutes late. It passed Daley's Ranch approximately 21 minutes later, about the same time as shown in the line-up. Soon thereafter, the train approached the accident area at 84 miles per hour, as indicated by the speed-recording tape. According to statements of both engineers, all the eastward block signals between Daley's Ranch and signal 6868 displayed Clear aspects and, when the train was 1.4 miles distant, they saw that signal 6868 was displaying an Advance-Approach aspect, but did not see any flagman's signals displayed at that time. The engineer applied the brakes and reduced the speed to 82 miles per hour while approaching this signal. Both engineers said they saw the flagman light a fusee a short distance ahead as the train was closely approaching signal 6868 and then saw a track motorcar occupying the eastward main track near the flagman. The engineer acknowledged the lighted fusee by sounding the locomotive horn and immediately applied the train brakes in emergency. However, before the train speed was reduced further, the locomotive passed signal 6868 and the flagman, and struck the track motorcar 175 feet east of the signal. Shortly thereafter, the engineer saw the other track cars occupying the eastward main track in the cut and curve. He sounded the locomotive horn in warning. The speed had been reduced to 75 miles per hour, when the train struck the signal maintainer's track motorcar and the track motorcar with the push car.

The trackman who worked with the flagman stated that his only assigned duty on the day of the accident was to operate the track motorcar used to transport the flagman. He stated that he used the shunt wire frequently, without authority, to cause eastward signals to display restrictive aspects to the rear of the track cars and thereby provide additional protection to that afforded by the flagman. He also occasionally used the shunt wire to actuate the lights of eastward block signals to determine from their aspects whether the detector car and crane were a short distance ahead or farther eastward.

According to instructions issued by carrier officials, when the crane is replacing a defective rail, the detector car must stand nearby at not less than 200 feet until the work is completed. The instructions require the crane and associated track cars to work close behind the detector car so that they may be protected against trains by the flagman assigned for the detector car. They also require the crane and associated track cars to clear the track for a train at the same time as the detector car.

The general track foreman stated he was familiar with the foregoing instructions, and he had assumed the track cars and track force were being protected at all times by the flagman for the detector car and crane. Because this was the usual practice he did not arrange for any member of the track force to provide additional flag protection for the track cars and track force when the detector car and crane proceeded to Rawlins to clear No. 10.

The investigation disclosed that the detector car and crane were cleared as extra trains and that a brakeman was assigned to perform service as a flagman for both. It also disclosed the accident occurred in territory where the flagman of a train need go back only a sufficient distance to

insure full protection against following trains moving at restricted speed, not exceeding 15 miles per hour unless other circumstances required full flag protection. Instructions issued by carrier officials to track supervisory personnel stated that the crane and track cars working with a detector car were required to work closely behind the detector car and be protected by the flag protection provided for the detector car, indicating the carrier officials intended to have the detector car, crane, and track cars protected by the same flagman. The instructions which have governed these operations since 1960, also stated that the detector car was required to remain in the vicinity of the point where a rail was being replaced until the work was completed. However, the investigation disclosed nothing to indicate that the foregoing instructions were issued in similar form to train-service employees.

The detector car and crane proceeded from the block of signal 6868 to the Rawlins siding and cleared No. 10 while part of the track force remained with track cars on the curve in the block of signal 6868. It is evident that the conductor-pilots and general track foreman had no common understanding as to operation as a unit or the manner in which flag protection was then being provided for the track cars remaining on the curve and thought the flagman would protect these track cars from following trains. They took no exception to the movement of the detector car and crane to the Rawlins siding without the other cars of the track force although all of the associated equipment should have either remained at or near the point where the rails were replaced until the work was completed or moved as a unit onto the siding.

The flagman had closely followed the detector car, crane and track cars into the block of signal 6868 and had positioned himself a short distance east of that signal. He assisted in attaching a shunt wire to the rails of the eastward main track at this point and apparently relied on the shunt wire to cause signal 6868 to display a Stop-and-Proceed aspect and eastward signals to the rear to display restrictive aspects. The shunt wire, however, was improperly or ineffectively applied and did not shunt the track circuits. Hence, when the detector car and crane moved out of the block of signal 6868, this signal was conditioned to display an aspect less restrictive than Stop-and-Proceed to any approaching eastbound train. Thus No. 10, which had not received any signal indication requiring its speed to be reduced, approached signal 6868 at such a high rate of speed it could not be stopped short of the track cars involved when the enginemen saw the flagman light a fusee.

### **Findings**

1 The flagman failed to provide full flag protection as required under the circumstances while defective rails were changed out and when the detector car and crane moved onto the siding leaving associated equipment of the defect-detector operation on the main track.

2 The general track foreman permitted the detector car and crane to proceed to the siding from the point where two defective rails had been replaced before the work was completed.

3 The general track foreman failed to comply with instructions requiring the detector car, crane and associated track cars to remain closely together and operate as a unit.



**Cause**

The accident was caused by failure of the flagman to provide adequate protection for associated equipment of the rail defect detector operation

**Recommendation**

That the Union Pacific Railroad Company immediately take such action as necessary to insure full protection for employees and equipment engaged in rail defect-detector operations

Dated at Washington, D C , this 14th  
day of October, 1965

By the Commission, Railroad Safety and Service Board

(SEAL)

H NEIL GARSON,  
Secretary

## APPENDIX

### Tracks

From the west on the main tracks there are, successively, a long tangent and a 1°00' curve to the left 701 feet to the first collision point and a considerable distance east of the second and third collision points. In this area, the average grade for eastbound trains is 0.55 percent descending.

### Signals

Signals 6868, 6856 and 6844 are of the color-light type and are approach lighted. The aspects, applicable to this investigation and the corresponding indications and names are as follows:

<i>SIGNAL</i>	<i>ASPECT</i>	<i>INDICATION</i>	<i>NAME</i>
6868	<i>Flashing yellow</i>	<i>Proceed on route indicated prepared to pass next signal at not exceeding 40 miles per hour</i>	<i>Advance Approach</i>
	<i>Red</i>	<i>Stop, then proceed at restricted speed to next home signal</i>	<i>Stop and Proceed</i>

The circuits are so arranged that if the blocks of signals 6868 and 6856 are unoccupied and the block of signal 6844 is occupied or the Rawlins west siding-switch is in reverse position signal 6868 indicates Advance-Approach. In this event, the cab signal of an eastbound locomotive approaching signal 6868 displays a clear aspect. In the event the block of signal 6868 is occupied, that signal displays a Stop-and-Proceed aspect.

Tests made after the accident disclosed the signals involved functioned properly.

### Carrier's Operating Rules

Restricted Speed - Proceed prepared to stop short of train, obstruction, or switch not properly lined, \* \* \* but a speed of 15 miles per hour must not be exceeded.

11 A train or engine finding a burning fusee on or near its track must stop before passing the fusee and may then proceed not exceeding 20 miles per hour for at least one half mile \* \* \* in order to be able to stop short of train or obstruction. \* \* \*

15 The explosion of two torpedoes is a signal to immediately reduce speed to 20 miles per hour \* \* \* keeping a close lookout for train or obstruction. \* \* \*

99 When a train stops, except when clear of the main track, the flagman must go back immediately with flagman's signals, a sufficient distance to insure full protection. \* \* \*

\* \* \*

Flagman's signals

Day signals - A red flag, not less than ten torpedoes and six fusees.

99(E) When track is obstructed or impassable, or before making it impassable or unsafe, it must be protected. \* \* \*

## Wyoming Division Bulletin Order No 1970 dated May 1, 1964

\* \* \*

Effective at once, when a train stops on main track where rear of train is protected by a continuous block signal system, flagman must go back immediately with flagman's signals, but need go back only a sufficient distance to insure full protection against following trains moving at restricted speed

This in no way modifies the requirements for full flag protection under other circumstances or where protection in accordance with Rule 99 is required by other rules

### Train

No 10 consisted of car-body type diesel-electric units 927, 937B, 973B and 960, coupled in multiple-unit control, 2 mail cars, 1 baggage car, 4 chair cars, 1 lounge car, 1 dining car, 1 lounge car and 3 sleeping cars, in that order. The cars were of all-steel construction. The brakes of the train had been tested and had functioned properly when used en route. The headlight was lighted.

As the train approached the accident point, the engineer and fireman were in the control compartment at the front of the locomotive. The other crew members were at various locations in the cars.

### Track Cars Involved

The track motorcars operated by the signal maintainer and the trackman assigned to transport the flagman were of the belt-drive type and had 5- to 8- horsepower gasoline engines. Each weighed 645 pounds and had a top, windshield, and 4-wheel brakes. The track motorcar with the push car weighed 1,800 pounds and had a 31-horsepower 4-cylinder gasoline engine. It also had a top, windshield, 4-wheel brakes, a 10-person seating capacity, and a four forward-speed and four reverse-speed transmission. The push car had four wheels and a capacity of 2,000 pounds.

### Damages

No 10 stopped with the front end two miles east of the first collision point. None of its equipment was derailed and there were no separations. The first and second diesel-electric units were slightly damaged.

Immediately after the second and third collisions occurred, the engineer released the locomotive brakes to keep the locomotive wheels from sliding. Because of this and a slippery rail condition caused by a solution deposited on the rails by the rail-defect detector car, the stopping distance for No 10 was increased considerably.

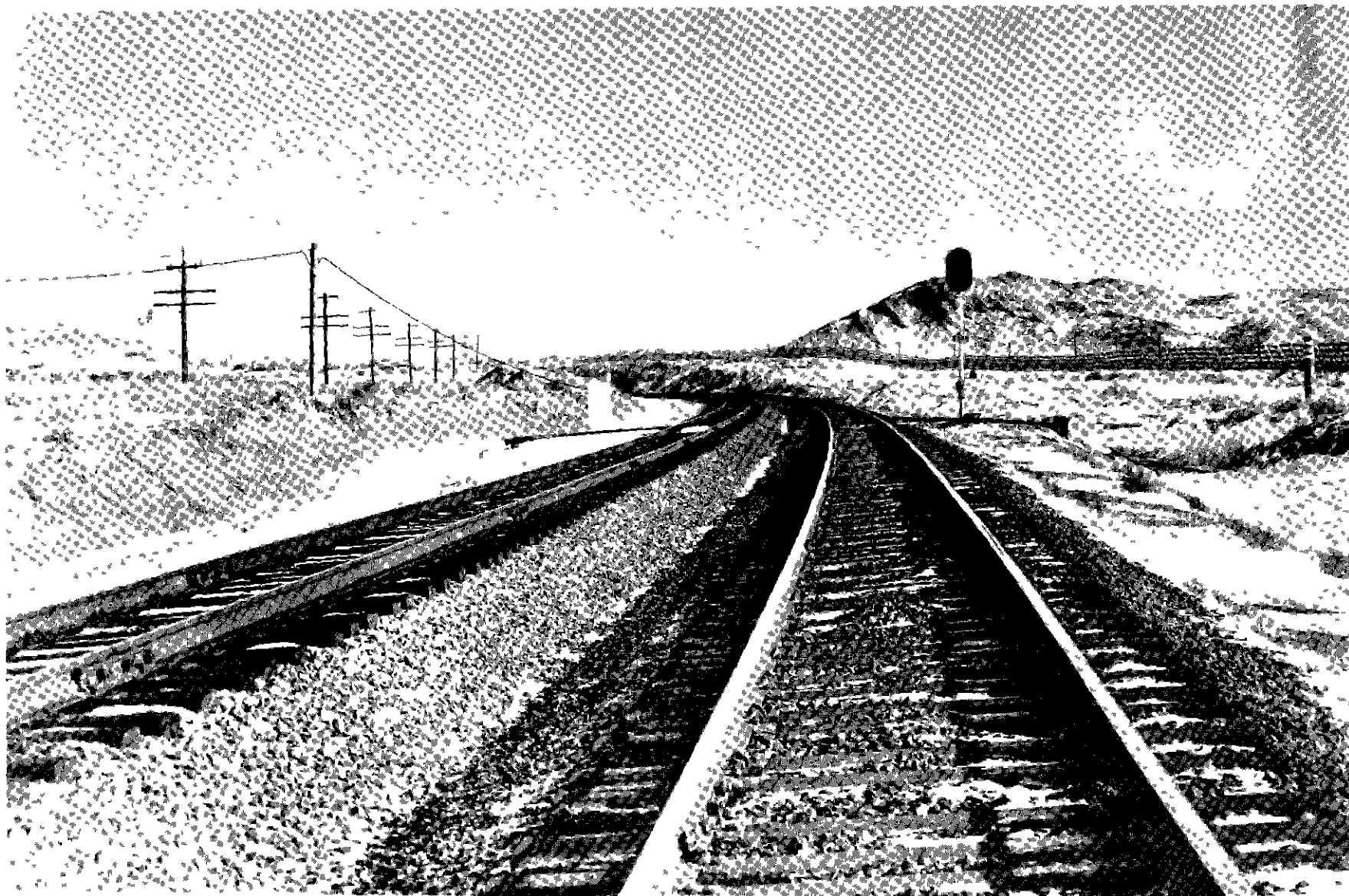
The three track motorcars and 1 push car were derailed and destroyed.

### Other Factors

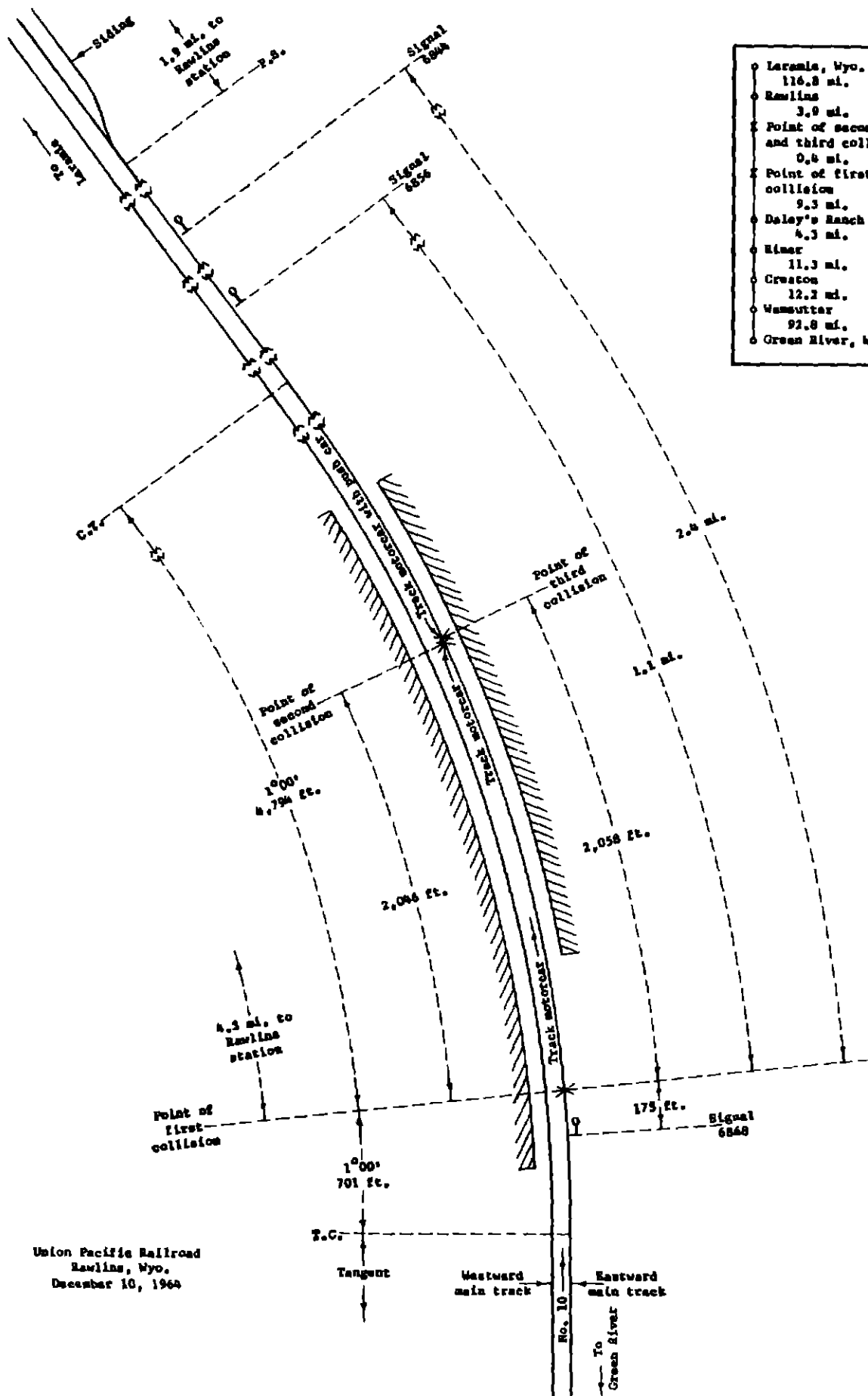
The accident occurred at 3 40 p m , in clear weather.

The maximum authorized speed for passenger trains in the accident area is 90 miles per hour.

The rail-defect detector car, crane and track cars proceeded eastward from Creston in the following manner. The electronic equipment of the detector car was in operation to detect defects in the rails. Whenever a defective rail was found, the detector car stopped and the general track foreman determined whether the rail should be replaced. When replacement was required, the detector car continued eastward while the crane, which was towing two push cars, replaced the defective rail. After the newly laid rail was in place, the crane with two push cars proceeded eastward and the track motorcar with one push car remained behind until the trackmen had secured the newly laid rail to the track structure. After the rail was secured, the signal maintainer attached bond wires at its ends. When this work was completed, the track motorcar with one push car and the track motorcar operated by the signal maintainer proceeded eastward to the next point where the crane had replaced a defective rail. The flagman, who was on the last track motorcar, followed the signal maintainer eastward and provided protection against following trains at varying distances to the rear of the detector car and crane.



*Eastward main track and signal 6868 at right First collision occurred on eastward main track 175 feet east of signal 6868 Second and third collision occurred in cut and curve farther eastward*



- o Laramie, Wyo. 116.8 mi.
- o Rawlins 3.9 mi.
- x Point of second and third collisions 0.4 mi.
- x Point of first collision 9.3 mi.
- o Delay's Ranch 4.3 mi.
- o Hiner 11.3 mi.
- o Creston 12.2 mi.
- o Wamsutter 92.8 mi.
- o Green River, Wyo.

Union Pacific Railroad  
 Rawlins, Wyo.  
 December 10, 1964

