

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD

MARVIN, S. DAK.

AUGUST 28, 1940

INVESTIGATION NO. 2443

SUMMARY

Inv-2443

Railroad: Chicago, Milwaukee, St. Paul and Pacific

Date: August 28, 1940

Location: Marvin, S. Dak.

Kind of accident: Derailment

Train involved: Passenger

Train number: First 6

Engine number: 144

Consist: 6 cars

Speed: 63 m. p. h.

Operation: Timetable, train orders and automatic block system

Track: Double; tangent; 1 percent descending grade eastward

Weather: Cloudy and fog pockets

Time: 10 a. m.

Casualties: 2 killed and 26 injured

Cause: Failure to obey slow order because of misunderstanding concerning its limits and failure to control speed in compliance with automatic block-signal indications

Inv-2443

October 11, 1940.

To the Commission:

On August 28, 1940, there was a derailment of a passenger train on the Chicago, Milwaukee, St. Paul and Pacific Railroad near Marvin, S. Dak., which resulted in the death of 2 trespassers, and the injury of 19 passengers, 2 railway mail clerks, 1 trespasser, and 4 train-service employees. The investigation of this accident was made in conjunction with a representative of the South Dakota Public Utilities Commission.

Location and Method of Operation

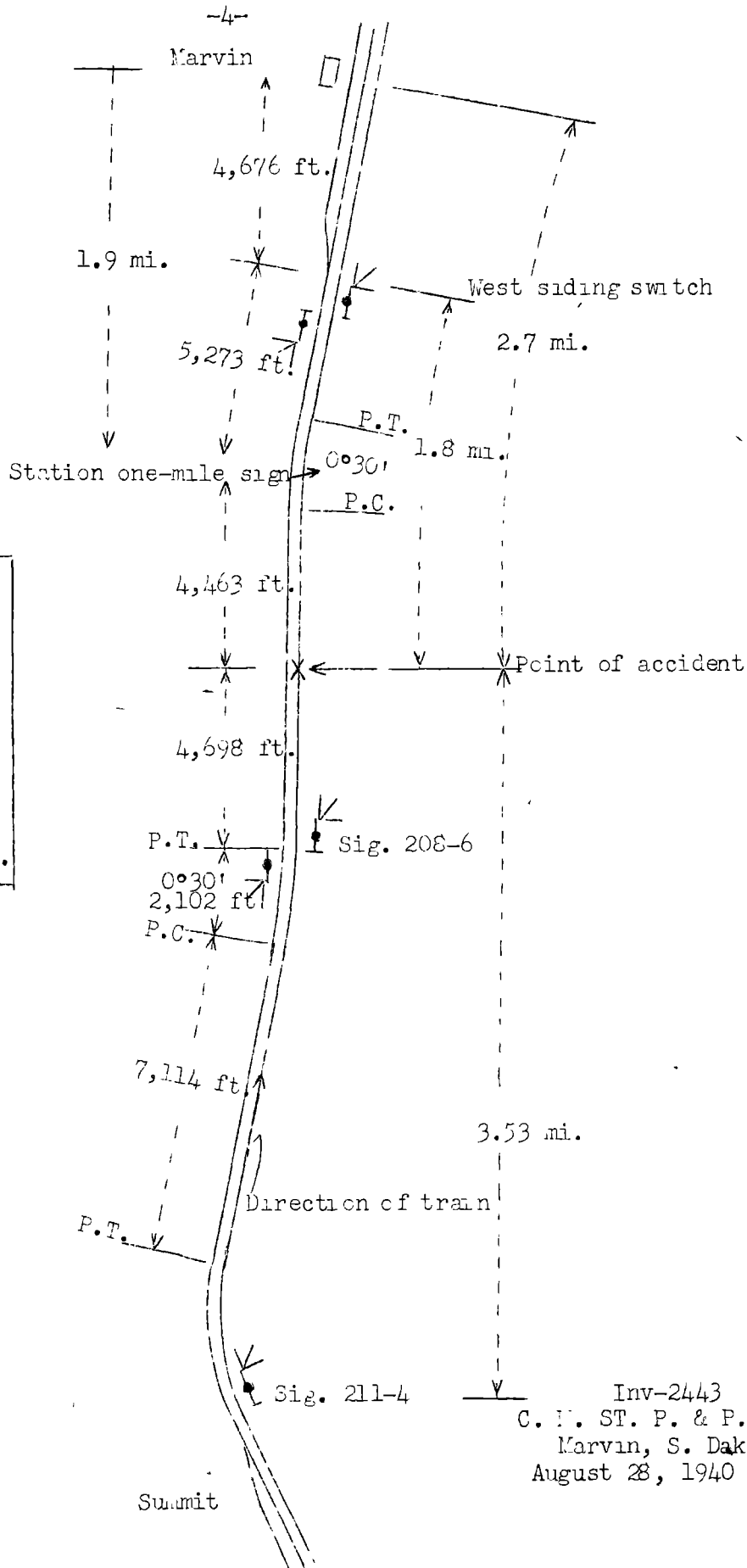
This accident occurred on that part of the Hastings & Dakota Division designated as the Second Subdivision which extends between Aberdeen Yard, S. Dak., and Montevideo, Minn., a distance of 157.2 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block system. The accident occurred on the eastward main track 2.7 miles west of the station at Marvin and 1.8 miles west of the west switch of the siding. As the point of accident is approached from the west there are, in succession, a tangent 7,114 feet in length, a 0°30' curve to the left 2,102 feet in length, and a tangent 4,698 feet in length to the point of accident and some distance beyond. At the point of accident the grade for east-bound trains is 1 percent descending.

In the vicinity of the point of accident both the eastward and the westward main tracks had been damaged by the derailment of a freight train on the day prior to the accident. The eastward track had been repaired to the extent that it could be used by trains moving at a speed not exceeding 5 miles per hour. The temporary track structure consisted of 90-pound rails, 33 feet in length, and some emergency 90-pound rails, 30 feet 10 inches in length; these rails were laid on 20 treated fir ties to the rail-length; the track structure at the time of the accident was single-spiked, 75 percent tieplated, and ballasted with pit-run gravel. There were no rail anchors provided and the track had not been bonded. The track was 6 inches out of alignment and the surface was irregular.

Signals 211-4 and 208-6 are located 3.53 miles and 0.89 mile, respectively, west of the point of accident. These signals are of the 3-position, upper-quadrant, semaphore type. Aspects, indications, and names are as follows:



○	Montevideo, Min..	71.6 mi.
○	Marvin, S. Dak.	2.7 mi.
x	Point of accident	4.5 mi.
○	Summit	77.9 mi.
○	Aberdeen	0.5 mi.
○	Aberdeen Yard, S. Dak.	



Inv-2443
 C. N. ST. P. & P.R.R.
 Marvin, S. Dak.
 August 28, 1940

<u>Aspect</u>		<u>Indication</u>	<u>Name</u>
Night	Day		
Red	Horizontal	Stop, then proceed at restricted speed	Stop and proceed signal
Yellow	45 degrees	Proceed preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed	Approach signal
Green	Vertical	Proceed	Clear signal

The Consolidated Operating Rules in use on the lines of this carrier read in whole or in part as follows:

Block Signal and Interlocking Rules.

Definitions.

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

Station. - A place designated on the time-table by name.

34. All members of train and engine crews must, when practicable, communicate to each other by its name, the indication of each signal affecting the movement of their train or engine.

509 (B). When a train is stopped by a stop and proceed indication, it may proceed:
* * *

(b) On any track signaled for traffic in one direction, at once at restricted speed through the entire block.

517. In foggy or stormy weather, enginemen must approach all signals with great care, prepared to respect the indication given.

726. A yellow flag or disc by day, and in addition a yellow light by night, placed on the engineman's side of the track, indicates that the track one mile distant is in condition for

a speed of not more than ten miles per hour, unless a different speed is specified by train order, bulletin, or Special Rule. * * *

808. When approaching and passing through stations or yards, or passing over railroad crossings, drawbridges, track covered by slow orders. * * * conductors and brakemen must, when practicable, station themselves where they can observe and transmit signals and assist in stopping train, if necessary.

C-501 (B) of the Special Rules read as follows:

The definition of Medium Speed is one-half of the authorized maximum instead of 30 miles per hour.

The maximum authorized speed for passenger trains is 70 miles per hour.

At Marvin the station mileboard for east-bound trains is located 5,273 feet west of the west switch of the siding and 1.9 miles west of the station.

The weather was cloudy and fog pockets existed at the time of the accident, which occurred about 10 a. m.

Description

First 6, an east-bound passenger train, with Conductor Wells and Engineman Pedlar in charge, consisted of engine 144, of the 4-6-4 type, one mail-express car, four coaches, and one sleeping car, in the order named; all cars were of steel construction. This train departed from Aberdeen, 85.1 miles west of Marvin, at 2 a. m., according to the train sheet, 3 hours 15 minutes late. At Summit, 7.2 miles west of Marvin, the train was held 6 hours 13 minutes on account of the derailment of a freight train near Marvin. The crew received copies of Clearance Form A and train order No. 41, Form 19, which read as follows:

Do not exceed 5 miles per hour on eastward track
2 miles west of Marvin.

First 6 left Summit at 9:53 a. m., 9 hours 4 minutes late, passed signal 211-4 displaying an approach indication, passed signal 208-6 displaying a stop indication, and, while moving at a speed of 63 miles per hour, as indicated by the tape of the speed-recorder with which engine 144 was equipped, became derailed at a point 1.8 miles west of the west siding-switch at Marvin.

Engine 144, badly damaged, stopped on its left side on the roadbed to the left of the eastward track with its front end 476 feet beyond the point of derailment; the tender remained coupled to the engine and leaned to the left at an angle of 45 degrees. The first two cars stopped parallel to the eastward track and leaned at an angle of 30 degrees; the third car stopped diagonally across the track, and the fourth car was derailed to the right; these cars leaned at an angle of 30 degrees and were badly damaged. The rear truck of the fifth car was derailed.

The employees injured were the engineman, the fireman, the conductor and the front brakeman.

Summary of Evidence

Engineman Pedlar stated that he thought signal 211-4 was displaying a proceed indication for his train. He did not see signal 208-6; he expected it to be out of order as bond wires had not been provided, and was not paying attention to signals but was looking for either a yellow flag, a stop flag, torpedoes or fuses. He fully understood the requirement of train order No. 41, but he expected the slow order to be in effect 2 miles west of the station at Marvin instead of 2 miles west of the west switch of the siding. He was about 50 feet west of the point where the previous accident occurred before he knew definitely where the slow-order was effective.

Fireman Hayes stated that the air brakes functioned properly en route. He read train order No. 41 and understood it to be in effect 2 miles west of the station at Marvin and not 2 miles west of the west switch which is located 4,676 feet west of the station. When his train left Summit fog restricted visibility to a distance of 10 car lengths. He did not see signals 211-4 or 208-6 because of fog and trailing smoke on the left side of the engine. He informed the engineman that he did not see either of these signals and the engineman called the indications of both signals as clear. At a point about 1/4 or 1/3 mile west of the point where the accident occurred the speed was about 50 miles per hour and he reminded the engineman about the slow order. At that time the fireman thought the slow order was in effect about a mile farther east. He did not see a flagging signal at any time, nor did he hear the explosion of a torpedo. The first indication of derailment was when the engine tipped to the right; at that time he heard the brake-pipe exhaust, which indicated that the engineman had started to apply the air brakes. Engineman Pedlar appeared to be normal and alert. Fireman Hayes was last instructed on operating rules in March, 1939. He understood Rule 34 but did not think that he was required to leave his usual place in the cab in order to comply with the rule. He said that his understanding of a station named in a slow-order was the

place designated on the timetable. When he was shown an order which was issued subsequent to the derailment of First 6 and which read in part, "All trains reduce speed to 3 mph and look out close for signals where derailment occurred about 2,500 feet west of milepost 207 to 1,000 feet east of milepost 208 between 2 and 3 miles west of cross-over at Marvin. * * *," he said that had such information been given in order No. 41, the speed of his train would have been controlled at the point involved and the accident would have been prevented.

Conductor Wells stated that just before his train left Summit he handed train order No. 41 to the engineman and warned him to be careful until their train had passed over the bad track. The engineman read the order to the conductor and appeared to be normal. Conductor Wells said that he had utmost confidence in the engineman and he did not pay attention to signal indications. Because of fog at Summit visibility was limited from 1/2 to 5/4 mile. On the descending grade from Summit to Marvin the train was moving about 50 miles per hour. He did not feel an application of the air brakes prior to the accident. He understood that the slow order was in effect 2 miles west of the station and not 2 miles west of the west switch of the siding. He said that he had been last instructed on rules in March, 1939.

Front Brakeman Howell stated that he read train order No. 41 and understood that the slow order was effective 2 miles west of the station at Marvin. When his train was leaving Summit he observed that signal 211-4 displayed an approach indication. He did not think the speed of his train exceeded 35 miles per hour between Summit and the point where the accident occurred. Because of fog visibility was restricted. When his train was approaching the point where the accident occurred he was in the third car. He did not feel an application of the air brakes prior to the derailment.

Flagman Lyons stated that he read train order No. 41 at Summit and understood it to be effective 2 miles west of the station at Marvin. After the accident he went back to flag. Because of fog pockets the marker lights on the rear of his train could be seen a distance of only about 10 or 12 car lengths.

Signal Maintainer Larson stated that on the day prior to the derailment of First 6 he disconnected the power wires and the relays on signal 208-6; this caused signal 208-6 to display a stop indication and signal 211-4 to display an approach indication, which indications these signals were displaying when First 6 passed them. He was placing bond wires at rail joints about 50 feet west of the point where First 6 was derailed when that train passed at a rate of speed which he estimated to have been about 60 miles per hour. Because of the fog he could see

a distance of only about 1,400 feet. After the accident signal 208-6 displayed a stop indication. He thought this signal could be seen a distance of about 800 feet. Signals 208-6 and 211-4 were lighted at the time First 6 became derailed.

Superintendent Dodds stated that he was at the scene of the accident when the derailment of First 6 occurred. He saw this train approaching about 1/2 or 3/4 mile distant and moving at a high rate of speed. He stood in the center of the track giving stop signals with his arms but his stop signals were not acknowledged. As the train passed him he saw that the brakes were not applied and he did not think they were applied at any time unless immediately prior to the derailment. His examination of the speed-recorder tape, when it was removed from engine 144 after the accident, disclosed that the speed was 63 or 64 miles per hour at the point of accident. He said that the maintenance-of-way force had not placed yellow flags as required by rule. The superintendent said that when an order specifies 2 miles distant from a station it means 2 miles from the switch where a train would enter the yard; also, according to the standards of the railroad, station one-mile signs are located 1 mile distant from the outside switch. When some yards had been lengthened station one-mile signs had been moved so as to be 1 mile from the outside switch. He said that after First 6 was derailed, it being apparent there was misunderstanding regarding the exact location where train order No. 41 was effective, train order No. 108 was issued, stating in exact terms the point where the slow order was effective.

Assistant Division Engineer Peterson stated that on a clear day signal 208-6 could be seen from the left side of an east-bound engine a distance of 2,658 feet, and from the right side a distance of 758 feet. He said that in computing mileage, stations as shown in the timetable, not switches, were used as locations.

Garman DeWalt, at Aberdeen, stated that the brakes of First 6 were tested before its departure from Aberdeen on the day of the accident, and all brakes applied and released throughout the train.

Discussion

According to the evidence, the derailment of a freight train on the day prior to the derailment of First 6 damaged the eastward and the westward main tracks at a point 2.7 miles west of the station at Marvin. Temporary repairs of the eastward main track had been made; however, the surface and the alinement were irregular. A train order restricting speed to 5 miles per hour at a point 2 miles west of Marvin was issued to First 6. Some of the rails had been replaced but the bonding for signal circuits

had not been completed. The maximum authorized speed was 70 miles per hour; First 6 was moving at a speed of about 63 miles per hour when it became derailed at a point where the track was 6 inches out of proper alignment and the surface was irregular.

All members of the crew involved thought that the slow order was effective at a point 2 miles west of the station at Marvin; the superintendent's interpretation was that the order was effective 2 miles west of the west siding-switch at Marvin, or 2.7 miles west of the station; the assistant division engineer said that in computing mileage, stations as shown on the timetable, not switches, are used as location points. After this accident occurred another slow order, definitely fixing the location, was issued because it appeared to the officials that possibly order No. 41 was not clearly understood. The fireman said that if the first order had read like the second order, the accident would not have occurred. If the employees involved had been instructed according to the management's interpretation, or if the order involved had stated the exact location of the defective track, it is probable this accident would have been averted.

Because of the bonding not being completed, the last two signals passed by the train involved prior to the point of accident, located 3.53 miles and 0.89 mile west of the point of accident, displayed, respectively, an approach indication and a stop-and-proceed indication. The first indication required the speed to be reduced to not exceeding 35 miles per hour and to be prepared to stop at the next signal; the second signal required the train to stop and then to proceed prepared to stop short of train, obstruction, or anything that might require the speed of the train to be reduced. The engineman understood that he was required to operate according to signal indications but since the circuits were disconnected he thought the signals did not govern the movement. The fireman said that because of foggy weather and trailing smoke he was unable to see the indications of the signals and so informed the engineman, who told him that the indications were clear. The fireman did not think the rules required him to leave his usual place to ascertain for himself the signal indications affecting the movement of his train. If the train had been operated in compliance with the indications of the signals mentioned it is probable that this accident would not have occurred.

The rules provide that a yellow flag or disc by day, and, in addition, a yellow light by night, placed on the engineman's side of the track, indicates that the track 1 mile in advance is not in condition for a speed in excess of 10 miles per hour. Although the weather was foggy, the engineman operated his train at usual speed, expecting to find the track protected either by a yellow flag placed 1 mile west of the defective track or by a

track flagman; however, according to the superintendent, the maintenance-of-way force had failed to display a yellow flag or to provide flag protection. If one of these precautions had been taken, it is probable the accident would have been prevented.

Conclusion

This accident was caused by failure to obey a slow order because of a misunderstanding concerning its limits and by failure to control speed in compliance with automatic block-signal indications.

Respectfully submitted,

S. N. MILLS,

Director.