

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 2950
NORTHERN PACIFIC RAILWAY COMPANY
REPORT IN RE ACCIDENT
NEAR LOGAN, MONT., ON
NOVEMBER 22, 1945

SUMMARY

Railroad: Northern Pacific
Date: November 22, 1945
Location: Logan, Mont.
Kind of accident: Derailment
Train involved: Passenger-equipment
Train number: Second 3
Engine number: 5132
Consist: 20 cars, cabooses
Estimated speed: About 80 m. p. h.
Operation: Timetable, train orders and
automatic block-signal system
Track: Single; 6° curve; 0.56 percent
descending grade westward
Weather: Clear
Time: 8:20 a. m.
Casualties: 2 killed; 1 injured
Cause: Excessive speed on sharp curve

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2950

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

NORTHERN PACIFIC RAILWAY COMPANY

January 8, 1946.

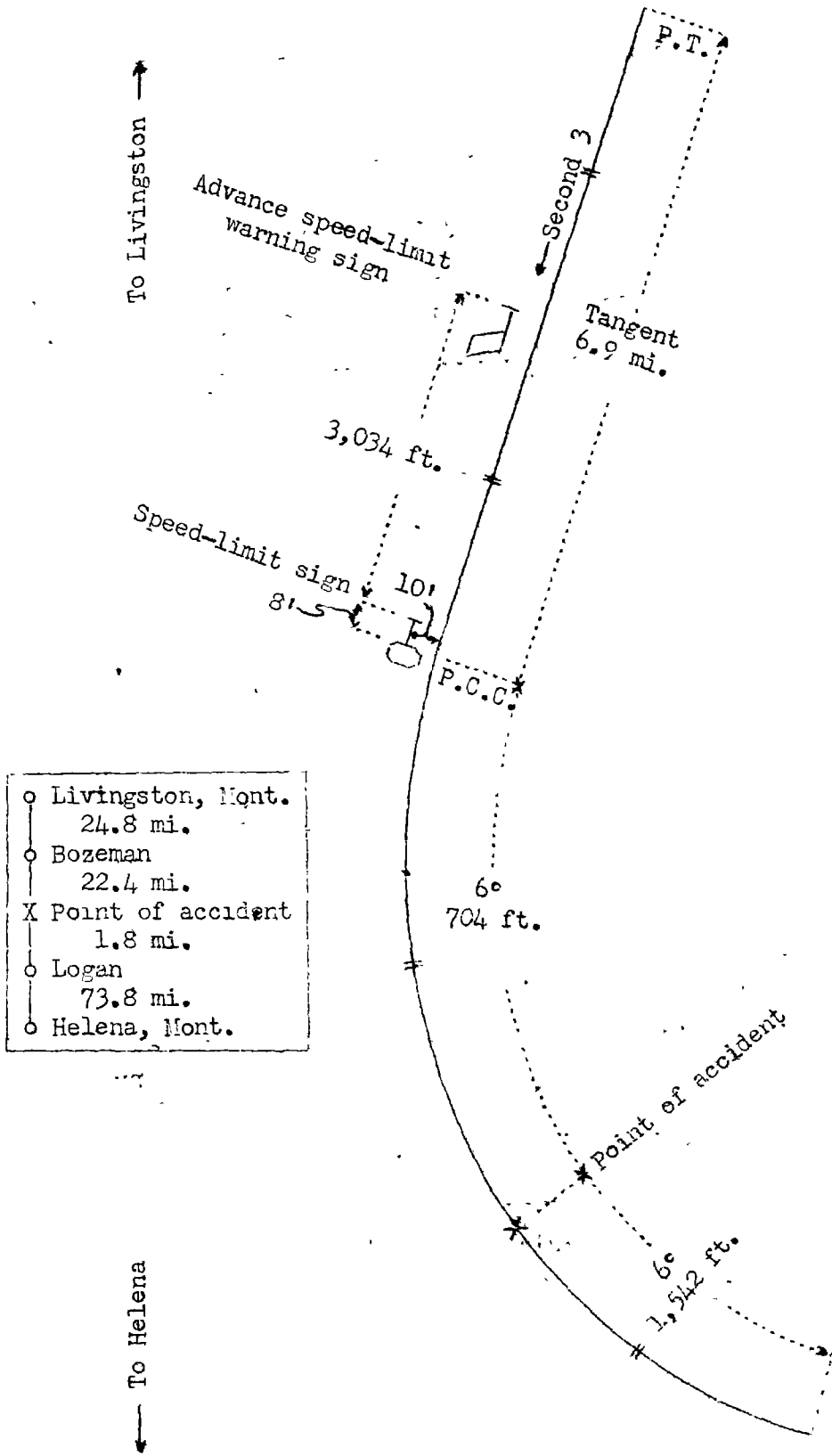
Accident near Logan, Mont., on November 22, 1945, caused
by excessive speed on a sharp curve.

REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On November 22, 1945, there was a derailment of a passenger-equipment train on the Northern Pacific Railway near Logan, Mont., which resulted in the death of two train-service employees and the injury of one train-service employee. This accident was investigated in conjunction with a representative of the Montana Board of Railroad Commissioners and Public Service Commission.

¹Under 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.



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|---|-------------------|----------|
| ○ | Livingston, Mont. | 24.8 mi. |
| ○ | Bozeman | 22.4 mi. |
| X | Point of accident | 1.8 mi. |
| ○ | Logan | 73.8 mi. |
| ○ | Helena, Mont. | |

Inv. No. 2950
 Northern Pacific Railway
 Logan, Mont.
 November 22, 1945

Location of Accident and Method of Operation

This accident occurred on that part of the Rocky Mountain Division extending between Livingston and Helena, Mont., 122.8 miles, a single-track line in the vicinity of the point of accident, over which trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred on the main track 47.2 miles west of Livingston, at a point 1.8 miles east of the station at Logan. From the east there is a tangent 6.9 miles in length, which is followed by a compound curve to the left 2,246 feet, the curvature of which varies between $0^{\circ}26'$ and 6° . The derailment occurred on this curve 704 feet west of its eastern end, where the curvature is 6° . The grade for west-bound trains varies between 0.35 percent and 0.80 percent descending about 2 miles, then it is 0.56 percent descending 322 feet to the point of derailment and 178 feet westward.

On the curve the track structure consists of 130-pound rail, 39 feet in length, laid new in 1931 on 23 hardwood ties to the rail length. It is fully tieplated, double spiked, provided with 4-hole angle bars, 10 rail anchors per rail length, and is ballasted with washed gravel to a depth of about 8 inches. The maximum superelevation on the curve was $4\text{-}\frac{7}{8}$ inches, and the gage varied between 4 feet $8\text{-}\frac{1}{2}$ inches and 4 feet $9\text{-}\frac{1}{4}$ inches. At the point of derailment the superelevation was $4\text{-}\frac{3}{4}$ inches, and the gage was 4 feet $9\text{-}\frac{1}{8}$ inches.

The maximum authorized speed on the curve is 45 miles per hour. An advance warning speed-limit sign 10 by 32 inches and a speed-limit sign 12 by 20 inches are located, respectively, 3,042 feet and 8 feet east of the east end of the curve and 10 feet north of the north rail of the track. Each sign bears the numerals "45". The numerals are 7 inches high, in black, and on a yellow background. On tangent track the maximum authorized speed for the train involved was 60 miles per hour.

Description of Accident

Second 3, a west-bound first-class passenger-equipment train, consisting of engine 5132, a 4-6-6-4 type, 20 sleeping cars and a caboose, in the order named, departed from Bozeman, the last open office, 22.4 miles east of the point of accident, at 7:54 a. m., 4 hours 1 minute late, and while moving at a speed of about 80 miles per hour the engine and the first nine cars were derailed.

The engine and tender stopped on their right sides, north of the track and at an angle of about 45 degrees to it, with the front end of the engine 340 feet west of the point of derailment. The first car, which became separated from the tender and the second car, stopped on its left side, north of the track and opposite the engine. The second car, which became separated

from the third car, stopped on its left side, south of the track and at an angle of about 15 degrees to it, with the front end 735 feet west of the point of derailment. The third to the ninth cars, inclusive, stopped upright and practically in line with the track, with the front end of the third car 1,040 feet west of the point of derailment. The engine, the tender and the first and second cars were badly damaged. The remainder of the derailed equipment was more or less damaged.

The weather was clear at the time of the accident, which occurred about 8:20 a. m.

The engineer and the front brakeman were killed, and the fireman was injured.

Engine 5132 is a single expansion articulated engine of the 4-6-6-4 type. The total weight of the engine in working order is 644,000 pounds, distributed as follows: Engine truck, 78,000 pounds; driving wheels, 444,000 pounds; and trailer truck, 122,000 pounds. The specified diameters of the engine-truck wheels, the driving wheels, the No. 1 and the No. 2 trailer-truck wheels are, respectively, 33, 70, 37 and 45-3/4 inches. The tender is semi-cylindrical in shape, and is equipped with a 4-wheel truck in front and a wheel assembly at the rear of 5 pairs of wheels mounted in a rigid frame, which is cast integrally with the bod of the tender. Its capacity is 27 tons of coal and 25,000 gallons of water. The weight of the tender loaded is 437,000 pounds. The wheelbase of each driving unit is 12 feet 4 inches long. The distance between the center of the engine truck and the centers of the No. 1 driving wheels is 8 feet 2 inches. The distance between the two driving-wheel units is 10 feet 9 inches. The total length of the engine wheelbase is 62 feet 2 inches, and the total length of the engine and tender is 126 feet 2-1/4 inches. The center of gravity of the engine is 80-1/4 inches above the tops of the rails and the center of gravity of the tender when fully loaded is 91 inches above the tops of the rails. The engine is provided with a speedometer and No. 8-ET brake equipment.

Discussion

Second 3 was moving on a 6° curve to the left when the engine and the first nine cars were derailed. The engine over-turned to the right without marking the outside rail or the area between the rails, and slid on its right side 340 feet beyond the point of derailment.

There was no defective condition of the engine prior to the accident. There was no indication of dragging equipment, defective track, or of any obstruction having been on the track. There was no condition found that would prevent the proper application of the train brakes.

The fireman said that as the train was approaching the curve on which the derailment occurred the engineer called his and the front brakeman's attention to the speedometer, which indicated a speed of 80 miles per hour. The fireman was alarmed because of the excessive speed, but did not warn the engineer as he was expecting him to take action to control the speed before the engine entered the curve. However, no such action was taken by the engineer. As the engine entered the curve it lurched to the right, then the derailment occurred. Visibility was unimpaired by weather conditions and there was no condition of the engine that distracted the attention of the enginemen or obscured their vision. The engineer and the front brakeman were killed. The conductor and the flagman, who were in the caboose, thought the speed of the train was about 60 miles per hour immediately prior to the derailment. They said that because the caboose was of the non-cupola type and because of dust from the roadbed it was difficult for them to see the speed-limit signs, and they were not aware of anything being wrong until the accident occurred. There was no application of the air brakes immediately prior to the derailment.

The surface, alinement and gage of the track on the curve were well maintained for the maximum authorized speed of 45 miles per hour. The division roadmaster said that the overturning speed at the point of derailment for engine 5132 was 77 miles per hour. From the manner in which the engine became derailed it is evident that the train was moving at overturning speed.

Cause

It is found that this accident was caused by excessive speed on a sharp curve.

Dated at Washington, D. C., this eighth day of January, 1946.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.