

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN  
ACCIDENT ON THE GREAT NORTHERN RAILWAY NEAR MILAN,  
WASH., ON DECEMBER 3, 1933.

February 14, 1934.

To the Commission:

On December 3, 1933, there was a derailment of a freight train on the Great Northern Railway near Milan, Wash., which resulted in the death of 4 employees and the injury of 2 employees. This accident was investigated in conjunction with the Washington Department of Public Works.

#### Location and method of operation

This accident occurred on the Fourth Subdivision of the Kalispell Division, extending between Hillyard, Wasa., and Troy, Mont., a distance of 134.67 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time table, train orders, and an automatic block-signal system. The accident occurred in a cut about 2 miles west of Milan; approaching this point from the west, there are several short curves and tangents, followed by a 6° 06' curve to the right 845 feet in length, the accident occurring on this curve at a point 497 feet from its western end. The grade for east-bound trains is 0.35 percent ascending at the point of accident. The automatic block signals are of the 1-arm, 3-position, upper-quadrant, approach-lighted semaphore type. East-bound signal 1456.2 is located 5,712 feet west of the point of accident.

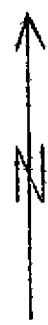
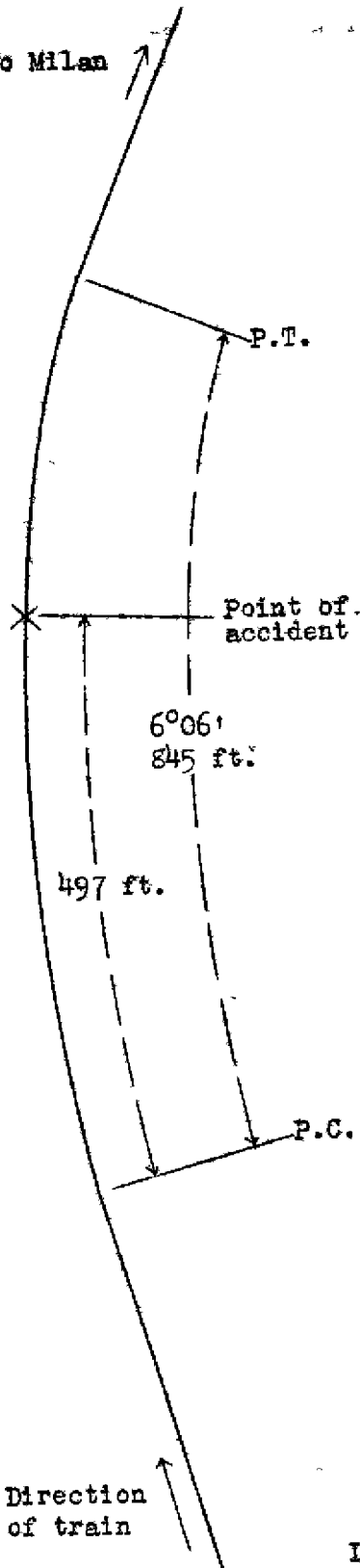
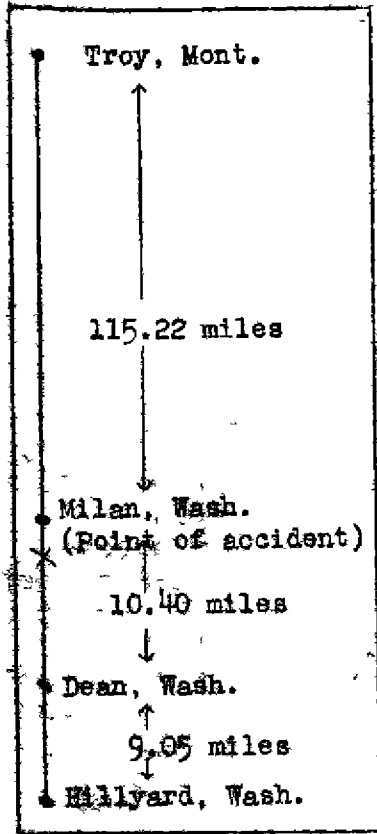
The track is laid with 90-pound rails, 33 feet in length, with an average of 20 ties to the rail length, tripled, spiked with seven spikes per tie on the curve, has eight rail anchors per panel, and is ballasted with gravel and well maintained. In this vicinity the track parallels the south bank of the Little Spokane River and there are numerous small cuts and fills. The accident occurred in a cut about 350 feet in length; the face of the slope on the south side is about 45 feet high at the point where a rock slide resulting in this accident occurred; the north slope is about 10 feet high at this point. The south slope is precipitous and is composed mostly of faulted granite. The faults or fissures extend horizontally, laterally and vertically into the walls and upward to the top of the rock, which lies just below the surface of the ground, there being a light covering of soil on top of the cliff. In many places the rock is entirely bare, leaving fissures open to receive surface water due to rain or melting snow.

The weather was clear at the time of the accident, which occurred about 10 p.m.

#### Description

East-bound Freight Train No. 472 consisted of 97 cars and a caboose, hauled by engine 2552, and was in charge of Conductor

To Milan



Area of displaced granite

Profile of cut

Direction of train

Inv. No. 1872  
 Great Northern Ry.,  
 Milan, Wash.  
 Dec. 3, 1933.

Horsfall and Engineman Barrett. This train left Hillyard, its initial terminal, 19.45 miles west of Milan, at 9:15 p.m., according to the train sheet, 2 hours and 25 minutes late, passed Dean, the last open office, 10.40 miles west of Milan, at 9:38 p.m., 2 hours and 18 minutes late, passed automatic signal 1456.2, which apparently was displaying a proceed indication, and on reaching a point 5,712 feet beyond the signal the train was derailed by a rock slide while traveling at a speed estimated to have been about 30 miles per hour.

Engine 2552, together with its tender and the first 5 cars in the train were derailed to the left; the following 14 cars were not derailed, but the next 14 cars were derailed and piled up within a distance of about 300 feet, the forward truck of the caboosc was also derailed. The engine and tender stopped on their left sides, down the bank of a fill at the east end of the cut. The employees killed were the engineman, fireman, head brakeman and middle brakeman, all of whom were riding on the engine, while the employees injured were the conductor and flagman, who were riding in the caboosc.

#### Summary of evidence

Conductor Horsfall and Flagman Cook stated that the first they knew of anything wrong was when the train stopped abruptly, they estimated the speed at the time of the accident to have been about 30 miles per hour. Conductor Horsfall went forward and after ascertaining that the trouble was due to a rock slide he continued eastward to Milan to summon aid, and at Milan he found the helper engine standing on the siding, it having preceded Train No. 472 from Hillyard in readiness to help the freight train eastward from Milan. Flagman Cook stated that he was riding on the right side of the cupola and that as the caboosc approached signal 1456.2 he observed it displaying a stop indication; as a result of the accident the caboosc stopped just east of that signal and he immediately went back to flag, going past the signal, and at that time it was still displaying a stop indication. Flagman Cook said that he could not say definitely whether the headlight of his engine was burning brightly, as the weather was clear and it was bright moonlight. Neither of these employees noticed any air-brake application just prior to the accident.

Helper engine 3128 left Hillyard at 9 p.m., according to the train sheet, passed Dean at 9:21 p.m., and continued to Milan for the purpose of helping Train No. 472 eastward from that point, and about 9:40 p.m. passed the point where the rock slide occurred. All of the automatic signals were displaying proceed indications, the headlight on their engine was burning brightly, and they noticed nothing unusual when their engine passed through the cut where the rock slide afterwards occurred.

On the day prior to the accident, Roadmaster Larson passed the point in question on a motor car but noticed nothing wrong and made no particular examination of the cut in which the accident occurred. He arrived at the scene of the accident on the wreck train about 3½ hours after its occurrence and found

no rails broken as a result of the derailment although several were twisted as a result of the accident. The rock in this particular cut was a hard granite formation and did not disintegrate like rock in cuts farther east. During the spring of 1932, a slide had occurred in this particular cut, about 30 cubic yards of material having been displaced at that time due to frost suddenly coming out of the ground and breaking out rock near the top, where there was some dirt. Previously this cut had been considered a safe one, but since the occurrence of the accident he thought that consideration should be given to the installation of a slide-detector fence at this location.

Section Foreman Holcomb has charge of the section on which the rock slide occurred, this section extending from the yard-limit board at Hillyard eastward to Elk, a distance of about 21 miles; at present he has one section man to assist him, but when any urgent work is necessary he obtains old section men who are located nearby to help him; no track walkers are maintained. He makes all patrols of the track on a motor car, going over the entire section practically every day, and the last time was on the day prior to the accident when the roadmaster was on the motor car. Section Foreman Holcomb said that in going over the track he pays close attention to cuts where there is danger from falling rock, but he considered this particular cut one of the safest on his section and when he last passed through it he noticed nothing out of the ordinary. On December 1 he checked the gauge and alignment of the curve and found the gauge  $\frac{1}{4}$  inch open and the surface good; the superelevation was 5 inches.

Assistant Engineer Burr made a survey of the territory surrounding the accident on the day following its occurrence and estimated that approximately 50 cubic yards of granite were displaced as a result of the slide. He said the granite in the cut lies in seams which extend upward to the top of the cut and that they are susceptible to saturation from surface snow or water which soaks through the exceptionally porous soil above and works into the seams along the face of the cut. Alternate spells of frost and thawing tend to expand and contract the seams so that it is possible for rock to be displaced and slip out, contributed to by vibration of passing trains. He estimated the maximum range of vision on the curve to be about 150 feet.

Traveling Engineer Sharar made a careful inspection of the engine at the scene of the accident, but found no defects having any bearing on the accident. There were no marks on the right side of the engine to indicate that it was struck by falling rock, and in his opinion the slide occurred before the train arrived.

Assistant Signal Supervisor Johnson stated that unless the track circuit was disturbed as a result of a rock slide the automatic signals would not indicate this condition and in his opinion the slide in this case did not disturb the track circuit.

### Conclusions

This accident was caused by a rock slide.

The slide consisted of about 50 cubic yards of granite which was displaced from the south face of the cut. It became dislodged from a point starting about 11 feet above the track and extending upward to a point about 25 feet above the track. Seepage of surface water into the various faults in the rock formation, with alternate periods of freezing and thawing, undoubtedly resulted in loosening the rock, and possibly coupled with the vibration of passing trains, caused the rock finally to become dislodged. The slide took place less than 20 minutes prior to the accident, as an east-bound helper engine passed through the cut about 9 40 p.m. at which time members of the crew of the helper engine noticed nothing wrong. It appeared probable that the track circuit controlling the automatic block signals was not disturbed as a result of the slide and therefore that the engine crew of the freight train received no warning of danger when passing the last east-bound signal assuming that the slide had come down before that time.

There had been a slide in this cut in the spring of 1932, somewhat smaller than the one here involved, and this previous experience with rock in which there are faults extending in all directions should have led to precautions to guard against a repetition. Such measures were not taken, however, and a second slide has been attended with disastrous consequences. Immediate consideration should be given to the necessity of preventive measures, such as installing a slide-detector fence, widening the cut, or adoption of such other steps as may be desired in order to provide safety at this point in future.

Respectfully submitted,

W. P. BORLAND,  
Director.

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