Inv-2343

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT OF THE DIRECTOR

BUREAU OF SAFETY

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ACCIDENT ON THE

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RAILWAY

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SUPERIOR, WIS.

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APRIL 8, 1939

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INVESTIGATION NO. 2343

SUMMARY

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Inv-2343

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| Railway: | Minneapolis, St. Paul & Sault Ste. Marie |
| Date: | April 8, 1939 |
| Location: | Superior, Wis. |
| Kind of accident: | Derailment |
| Train involved: | Mixed |
| Train number: | Extra 3010 |
| Engine number: | 3010 |
| Consist: | 39 freight cars, 1 coach, 1 mail and express car |
| Speed: | 15 m.p.h. |
| Operation: | Timetable, train orders and manual block system |
| Track: | Single; 4° curve to the left; level |
| Weather: | Clear |
| Time: | 4:24 p.m. |
| Casualties: | 1 killed |
| Cause: | Probably caused by wear on bearings on cradle castings of engine truck, combined with wear on spring casing of centering device of trailer truck. |

Inv-2343

May 17, 1939.

To the Commission:

On April 8, 1939, there was a derailment of a mixed train on the Minneapolis, St. Paul & Sault Ste. Marie Railway at Superior, Wis., which resulted in the death of one employee.

Location and Method of Operation

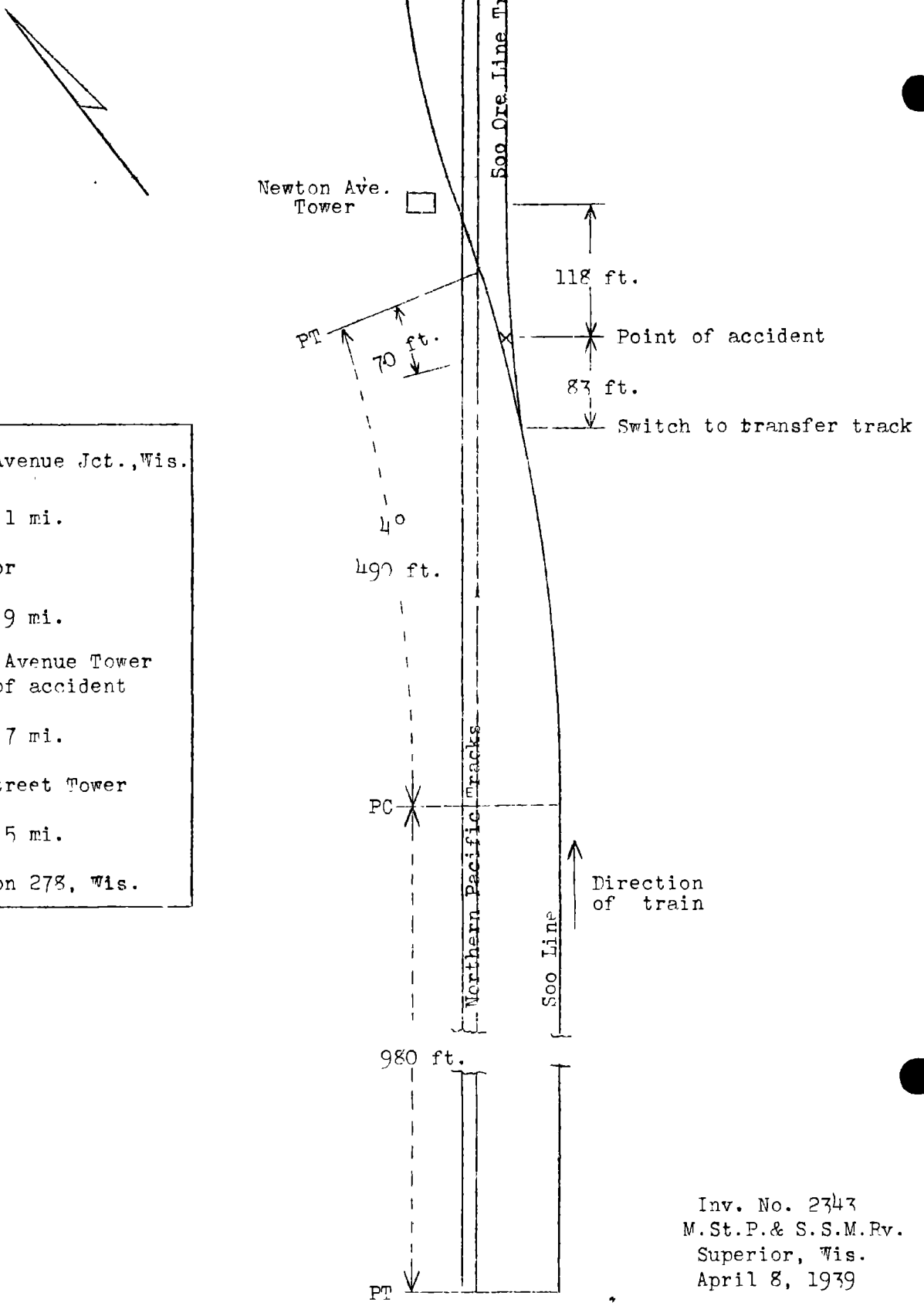
This accident occurred on that part of the Duluth-Superior Terminals which extends between Tower Ave. Jct. and Junction 278, Wis., a distance of 8.2 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable and train orders, and between 73rd Street Tower and Newton Avenue Tower, by manual block system. The derailment occurred at the guard rail opposite the frog of a turnout leading to a track known as the Soo Ore Line transfer, at a point 116 feet west of Newton Avenue Tower, which in turn is located 4.9 miles west of Superior. Approaching this point from the west there is a tangent 980 feet long, followed by a 4° curve to the left 490 feet long, which includes 231 feet of spiral at its western end; the derailment occurred on this curve at a point 70 feet from its eastern end. The grade is practically level.

The accident occurred within the limits of an interlocking which governs movements over a Northern Pacific crossing located a short distance beyond the point of accident, the tower being located in the northwest corner of this crossing.

The track structure consists of 80-pound rail, 33 feet in length, laid on an average of 20 hardwood ties to the rail length; it is double-spiked on curves, fully tie-plated, and ballasted with gravel to a depth of 12 inches. The switch involved leads to the right through a No. 10 turnout. The guard rail, 11 feet long, was bolted at each end and fastened in the middle with two clamps; it had been renewed the morning of the accident.

Mixed trains are restricted to a speed of 25 miles per hour over all railroad crossings.

The weather was clear at the time of the accident, which occurred about 4:24 p.m.




- Tower Avenue Jct., Wis.
- 0.1 mi.
- Superior
- 4.9 mi.
- Newton Avenue Tower
- X Point of accident
- 1.7 mi.
- 73rd Street Tower
- 1.5 mi.
- Junction 278, Wis.

Inv. No. 2343
M.St.P.& S.S.M.Rv.
Superior, Wis.
April 8, 1939

## Description

Extra 3010, an east-bound mixed train, consisted of 39 freight cars, 1 coach, and 1 mail and express car, in the order named, hauled by engine 3010, of the 2-8-2 type, and was in charge of Conductor Pike and Engineman Cottle. This train departed from 73rd Street Tower, the last open office and 1.7 miles west of Newton Avenue Tower, at 4:12 p.m., according to the train sheet, and when approaching Newton Avenue Tower was derailed while traveling at a speed estimated to have been about 15 miles per hour.

The engine stopped between the Northern Pacific tracks and the Soo Ore Line transfer track and leaned at a slight angle to the left with its front end 170 feet beyond the point of derailment. The tender stopped at practically right angles to the engine, telescoping the left rear side of the engine cab. The first car stopped parallel to the tender and was destroyed. The second car stopped on its side to the right of and in line with the first car. The third to sixth cars, inclusive, were derailed and stopped at various angles on the main track. The thirty-sixth car was derailed and slightly damaged, and the draft gear on the last car in the train was damaged.

The employee killed was the fireman.

## Summary of Evidence

Engineman Cottle stated that the air brakes had been tested at Glenwood, their initial terminal, and the brakes functioned properly en route. Approaching Newton Avenue he eased off on the throttle, and the train was traveling between 12 and 15 miles per hour when he felt the engine become derailed; he immediately applied the air brakes in emergency. His train had entered sidings at several places en route, and he did not observe any unusual condition as the engine passed over the switch frogs or rounded curves. The engine was in good condition and there was no evidence of binding at any time. He had previously operated a similar engine and had not experienced any trouble with it.

Conductor Pike stated that the weather was clear. His statement contained nothing additional of importance.

Head Brakeman Ely, who was in the coach, estimated that the speed was between 12 and 15 miles per hour when the train stopped suddenly as a result of an emergency application of the air brakes. Flagman Hanlon estimated

that the speed was about 15 miles per hour at the time of the accident.

Towerman Paul, on duty at Newton Avenue Tower, stated that after lining the route for Extra 3010 he saw this train approach at a speed of about 15 miles per hour, and when the engine was between the switch leading to the Soo Ore Line transfer track and the tower he saw it become derailed. No. 64 had proceeded eastward over the main track about 4:11 p.m., and a section motor car had proceeded westward just prior to the arrival of Extra 3010.

Section Foreman Sanda, in charge of the track on which the accident occurred, stated that on the morning of the accident he changed the guard rail at the switch involved because the old guard rail was somewhat worn. It is a Soo Line standard 11-foot guard rail and is bolted on each end and fastened in the middle with two clamps. The track was in good condition and it was not necessary to gage it or to disturb it in any other manner. He rode over this track on his section car with five members of his crew approximately 2 minutes prior to the accident, and none of them observed anything wrong with the track.

Maintenance of Way Engineer Whitman stated that subsequent to the accident the gage, cross levels, alinement, and surface were checked; the track was in good condition and nothing was found that would have contributed to the cause of the derailment.

Master Mechanic Stanton stated that he inspected the engine as it stood immediately after the derailment. All wheel flanges were good and he could not find anything that could have contributed to the cause of the derailment. The engine was rerailed, and the following day several attempts were made to move it over the switch involved, and each time as the engine truck approached the frog, the left engine-truck wheel would rise and it would have dropped off the guard rail if the engine had not been stopped. Careful inspections were made, but nothing binding on the engine could be found. The wing rail was then spiked, and the engine was moved safely through the switch. On April 10 tests were made with engines 3010 and 3007, engines of the same type. Engine 3007 passed over the guard rail safely, but the left engine-truck wheel on engine 3010 would rise each time from the rail. Two different times when the right pin of the centering device on the trailer truck was disconnected, the engine-truck wheels negotiated

the frog safely. The locomotive was taken to the shop where the right casing of the trailer-truck centering device was cut from the locomotive frame and the parts removed and inspected. The springs were the required standard and he could find nothing wrong with either them or the end spools. The casing was slightly worn but in his opinion the wear was not of sufficient depth to cause the springs to bind or to require renewal of the casing before again placing the engine in service. As a result of his inspection Master Mechanic Stanton was not able to state just what caused the engine truck to be derailed, saying that it would require further study.

According to records furnished by this carrier, engine 3010 is a 2-8-2 type locomotive with a total wheel base of 34 feet 10 inches and a rigid wheel base of 17 feet. The distance between centers of the engine-truck wheels and the first drivers, and the trailer-truck wheels and the rear drivers is 9 feet 2 inches, and 8 feet 8 inches, respectively. The overhang of the engine frame from the trailing wheels is 7 feet 1 inch, and that of the tender is 5 feet 3½ inches from the front tender wheels. The engine truck is equipped with a resistance rocker centering device and the trailer truck with a spring centering device. The distance between centers of the rear tender wheels and the engine-truck wheels is 67 feet ½ inch.

## Observations of Commission's Inspectors

Inspection of the track by the Commission's inspectors did not disclose anything wrong with the track. The main rails, switch, frog, and guard rail were in good condition, and the track was in proper gage. The frog was temporarily removed from the track and a straight rail installed in place of it to facilitate the movement of the wrecking derrick in clearing up the wreckage. The same frog was replaced in the track at the same location, using the same spike holes in the ties. No change was necessary in any part of the track after the wreckage was cleared away. The Commission's inspectors were present when engine 3010 was pulled over the track at the point of derailment on the two days following the accident, and it was evident that the derailment was not caused by any defect in the track.

The first mark of derailment was a flange mark made by the left front engine-truck wheel on the top surface of the guard rail, beginning at a point 18 inches west of the center of the guard rail and extending eastward diagonally to the end of this rail; this mark continued along the ties

in a diagonal direction toward the right. A small bright mark on the side of the point of the frog evidently was made by the flange of the right wheel.

At the Superior roundhouse, the trailer-truck centering device was removed and dismantled. The device showed little wear and no binding of any of the parts; slight wear was found on the inside of the spring casing, but it alone was not sufficient to cause the derailment. The engine was then moved to the Shoreham Shops, Minneapolis, where a more thorough inspection was made by the officials of the railroad in the presence of the Commission's inspectors. The engine truck was dismantled, cleaned, and inspected. Slight wear was found on the bearings of the cradle castings, but the bearings had been well lubricated, and the wear itself was not considered sufficient to cause the derailment. The lateral clearances on all engine wheels were within the Federal requirements. The running gear and all flanges were in good condition and the tire wear on all wheels was 1/16 inch. The draw-bar between the engine and the tender was not binding and it had free lateral movement.

Engine 3010 had been operated frequently over the track involved and had passed safely over this track westward April 3, 5, and 7, and in eastward movements April 4 and 6.

## Discussion

As the engine was passing over the switch involved the engineman felt the engine become derailed and he immediately applied the air brakes in emergency. The engine stopped with its front end 170 feet beyond the point of derailment. Inspection of the track disclosed it to be in good condition and there was no indication that it contributed in any way to the accident. Subsequent to the accident, engine 3010 was pulled over the track several times, and each time as the engine truck reached the guard rail the left wheel would rise from the rail, but the engine was stopped before it became derailed. Two movements were made with the right pin of the centering device on the trailer truck disconnected and the engine negotiated the frog safely. Both the engine and the trailer trucks were removed and dismantled; slight wear on the bearings of the cradle castings on the engine truck and also slight wear on the inside of the spring casing of the centering device of the trailer truck were disclosed. Since the engine failed on the trial runs to negotiate the frog safely, except when the right pin of the centering device on the

trailer truck was disconnected, it appears probable that the combined wear of these two portions of the equipment resulted in a rigid or binding condition, preventing the engine from properly following the curve, which resulted in its derailment.

## Conclusion

This accident probably was caused by the wear on the bearings on the cradle castings of the engine truck, combined with the wear on the spring casing of the centering device of the trailer truck.

Respectfully submitted,

W. J. PATTERSON,

Director.