

Inv-2160

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RY.
FULLERTON, N. DAK.

MARCH 17, 1937

INVESTIGATION NO. 2160

SUMMARY

Inv-2160

Railroad: Minneapolis, St. Paul & Sault Ste. Marie
Date: March 17, 1937
Location: Fullerton, N. Dak.
Kind of accident: Derailment
Train involved: Mixed
Train number: No. 250
Engine number: 801
Consist: 25 freight cars, 3 passenger cars
Speed: 25-30 m.p.h.
Track: 2⁰ portion of compound curve to left;
level
Weather: Clear
Time: 6:00 p.m.
Casualties: 1 killed
Cause: Spread track and outside rail of curve
turned over, due to bad track conditions

April 15, 1937.

To the Commission:

On March 17, 1937, there was a derailment of a mixed train on the Minneapolis, St. Paul & Sault Ste. Marie Railway near Fullerton, N. Dak., which resulted in the death of one employee. This accident was investigated in conjunction with the North Dakota Board of Railroad Commissioners.

Location and method of operation

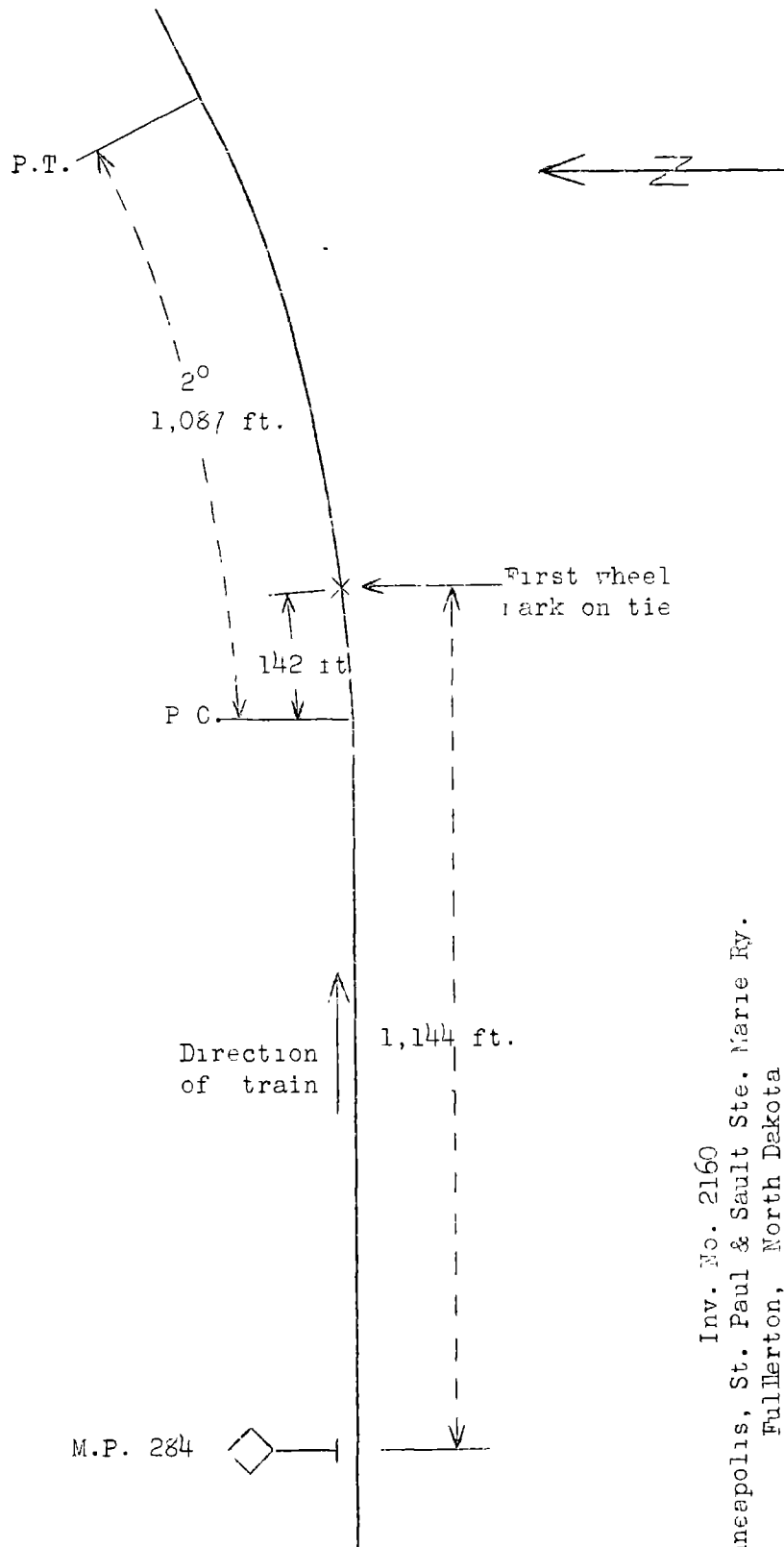
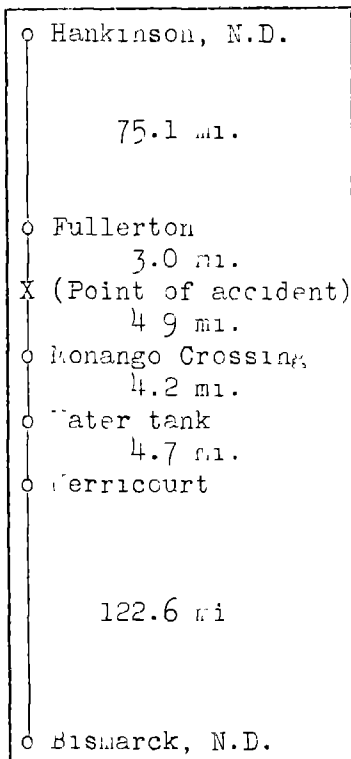
This accident occurred on the First Subdivision of the Missouri River Division, extending between Bismarck and Hankinson, N. Dak., a distance of 214.5 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by timetable and train orders, no block-signal system being in use. The accident occurred about 3 miles west of Fullerton; approaching this point from the west the track is tangent for more than 1 mile, followed by a compound curve to the left 1,037 feet in length, with a maximum curvature of 2° , the first wheel mark appearing on a tie on this curve at a point 142 feet from its western end, where the curvature is at its maximum. The grade is level for a considerable distance on each side of the point of accident.

The track is laid with 60-pound rail, 30 feet in length, with an average of 16 ties to the rail length, partly tie-plated on curves, single-spiked, with 2 rail anchors per rail and ballasted with from 3 to 8 inches of gravel on top of about a foot of gumbo. The general alinement and surface of the track is fair; no shims or rail braces are used and the maintenance is poor. The maximum superelevation of the outside rail of the curve involved is 2 inches. Speed of mixed trains is restricted to 30 miles per hour.

The weather was clear at the time of the accident, which occurred about 6:00 p.m.

Description

Train No. 250, an east-bound mixed train, consisted of 25 freight cars, 1 combination mail-express car, 1 baggage car and 1 coach, in the order named, hauled by engine 801, and was in charge of Conductor Power and Engineman Clinton. This train left Merricourt, the last open office, at 5:22 p.m.,



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Fullerton, North Dakota
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stopped for water at a point 4.7 miles beyond, stopped at Monango, 4.2 miles farther on, to let off a passenger, and on reaching a point about 4.9 miles beyond Monango was derailed while traveling at a speed estimated to have been about 25 or 30 miles per hour.

Engine 801, its tender, the first 12 cars, and the forward truck of the thirteenth car, were derailed toward the south. The engine was headed southeast and tipped to the left, with its front end 68 feet from the track and about 400 feet east of the first wheel mark on the ties; its cab was badly damaged. The cars stopped at various angles. The employee killed was the fireman.

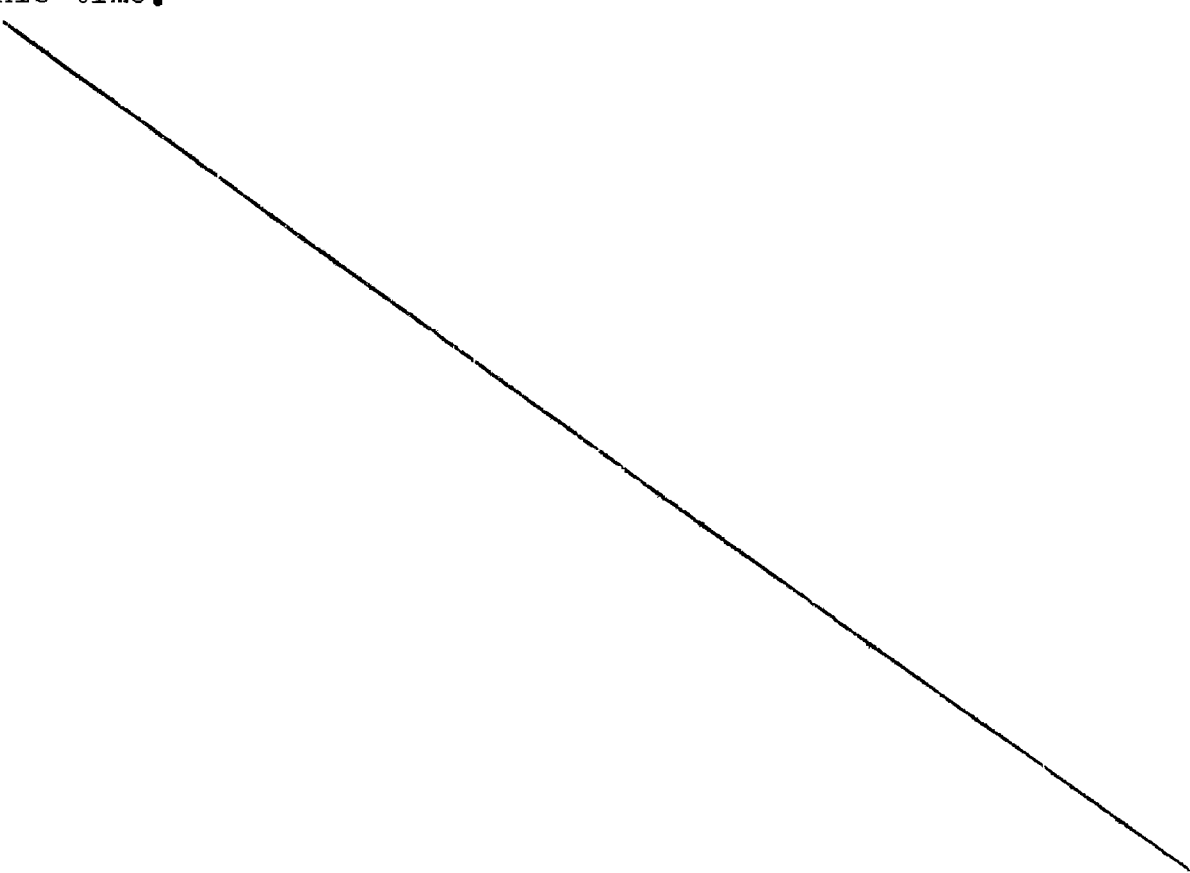
Summary of evidence

Engineman Clinton stated that the speed of his train was from 28 to 30 miles per hour and the first he knew of anything wrong was when he felt the front part of the engine leave the rails; he immediately applied the air brakes in emergency, following which the entire engine dropped and listed to the right, then righted itself and listed to the left. He examined the engine to some extent after the accident and again the next morning, but he could not find anything about it that would have caused the accident. The forward wheels on the left side of the engine appeared to have been the first to become derailed, jumping as though there may have been something on the rail to raise them, but although he looked he could not find anything of that character. He did not notice any unusual riding qualities of the engine on the westward trip the day prior to the accident the engine rode normally on the trip involved. The air brakes worked properly and he inspected the engine en route whenever it was possible to do so. He could not form any opinion as to what caused the accident.

Conductor Power, Head Brakeman White and Flagman Abbott were on the rear of the train. They stated that the speed was about 25 to 30 miles per hour; the first they knew of anything wrong was on feeling a slight jolt, after which the brakes were applied in emergency and the train stopped. The air brakes were tested and worked properly and the train was inspected en route, but nothing wrong was found. There was nothing unusual about the riding qualities of the train and track conditions seemed to be all right. Head Brakeman White rode the engine between several different points and he said that it rode well. They did not advance any opinion as to what caused the accident.

Roadmaster Appelquist arrived at the scene of the accident about 1:30 a.m., March 18, and inspected the track with a lantern, and later by daylight. Several of the south rails of the curve were dipped to the south; the spikes were pulled up and part of the rails were still in a semi-turned position, while some had settled back to nearly an upright position, with car wheels standing on them. The wheels were on the head of the rail, but the rail had turned over and returned to position again and several of the spikes were under the base of the rail. Quite a few of the north rails were torn out during the accident, some remaining upright and a number being damaged by the cars. It was necessary to renew all rails between the initial point of derailment and the point where the engine stopped. He did not notice any defective equipment or any foreign obstacle from train equipment that would have caused the accident. He could form no estimate of the speed of the train from the condition of the wreckage, but he thought the force of the engine against the south or outside rail caused the rail to turn over; however, he could not say why it gave way. When this occurred, the north wheels of the engine dropped inside and the south wheels rode on the web of the overturned rails, the rails continuing to turn over ahead of the engine for a distance of about 220 or 250 feet until one of them finally broke, precipitating the general derailment. Roadmaster Appelquist stated that he was familiar with track conditions in this vicinity. He was last over this portion of track on a section motor car about the middle of December, 1936. On March 10, ties were unloaded between Hankinson and Wishek, and he rode on the engine of the work train; nothing wrong was noticed with the riding qualities of the track at that time. Section foremen are required to inspect their track daily, unless otherwise instructed by the roadmaster. When inspecting the track from section motor cars the speed is only a few miles per hour; quite often the inspection is made on foot. The ties in this vicinity were in fair condition, quite heavy renewals having been made during the last 3 or 4 years. A considerable number of tieplates have been installed since 1933; the first treated ties were received in 1935. He had never been denied material required for repairs. Loose spikes which can be pulled out by hand are often found in old ties, especially in old hemlock ties, it being impossible to keep the spikes down in such ties. He did not know that the cross levels in the immediate vicinity of the point of accident were in bad condition nor that the

track was from 3/4 to 1 inch out of gauge. The roadbed was frozen solid and there was no heaving, washing or softening of track; when the track was repaired it was necessary to dig out each tie that was to be replaced. He thought the track was safe for a speed of 30 miles per hour and said that it was left to the section foreman to determine whether or not he could properly care for the 14 miles of track on his section and keep it in good condition alone; if not he was to request help. Track laborers are usually laid off in the fall when frost sets in and track repairs cannot be made; men are employed during the winter whenever storms or other conditions make it necessary and laid off again when the emergency ceases. On some sections it is necessary to keep help all winter. Section Foreman Kunz, in charge of the section involved, had been alone on his section since last December except during snow storms. As a rule when foremen are left alone they do not often ask for extra help as their work consists chiefly of track inspection, cleaning switches and station platforms during the winter, and it is not the practice to do any extensive track work during this time.



Roadmaster Erickson stated that his territory extended from Minneapolis to Glenwood. When he arrived at the scene of the accident track repairs had been practically completed. He inspected the track for a distance of 1,000 feet west of the point of derailment and found it to be safe for a speed of 30 miles per hour. The ties were in fair condition, but loose spikes were found in some places. The curve involved was 50 per cent tieplated. He did not see any spikes that could be pulled by hand, but the track fastenings were a little loose and there was a small percentage of decayed ties. The left wheels of the engine dropped inside the north rail, and the right wheels rode the web of the south rail. Nothing was found about the condition of the engine that would have caused the accident. In his opinion the accident would have been averted had the curve on which it occurred been fully tieplated.

Section Foreman Kunz stated that his section extends from milepost 273 to milepost 287 and comprises 14 miles of main track and 1 mile of sidings; the accident occurred 1,144 feet east of milepost 284. His headquarters are at Fullerton, and he works 8 hours a day; it requires about 3 hours to patrol his section on a motor car and he inspects the track practically every day. About 2 inches of snow had fallen on the day of the accident, but it was gone by 9:30 a.m. He inspected the west end of his section between Fullerton and milepost 287 and reached Fullerton on his return about 11:00 a.m., after which he inspected the east end of the section; these inspections were made from his track motor car and no track irregularities were noted. He did not again pass over the track involved prior to the accident. When he reached the scene of the accident the south rail was tipped over to the south, pulling spikes with it, and the track was badly damaged; he could not find anything that would have caused the accident, but thought the track would have been safer provided tieplates were placed on curves. In reporting the accident to his superiors he gave the cause of the accident as being due to south rail of curve turning over under the engine. He had been over the track practically every day during the 30-day period prior to the accident. The last work performed on the curve involved was about the time his only laborer was laid off, during the early part of last November. He had not asked for additional help or material within the last 2 or 3 years but when in need of material or labor it was not denied him. The track on his section is safe for a speed of 30 miles per hour and he did not consider that additional help was necessary. The track on the curve involved was last gauged during tie renewals in the latter

part of June, but about one month ago high water was experienced in this vicinity and he gauged nearly the entire curve at that time; there had been no spread track at this point. The drainage is adequate for ordinary conditions, but trouble is experienced with heavy snow. There did not appear to be any softening of the roadbed, and there was very little frost in the ground.

Master Mechanic Clapp arrived at the scene of accident on the wrecker. The left driving wheels of the engine were buried in the ground; however, an inspection was made of the engine as carefully as could be done under the circumstances and nothing was found mechanically wrong that would have caused the accident. Apparently either the right front driving wheel or the right front engine truck wheel was the first to become derailed, running on the web of the south rail a considerable distance before leaving the line of track. He did not know what caused the accident, or what caused the outside rail of the curve to overturn; there was no indication of excessive speed.

Assistant General Roadmaster Hayes stated that he visited the scene of the accident two days after the accident. From the evidence that he could see at that time he was inclined to believe that the gauge had been somewhat wide, and that the rail turned over under the equipment. Tie renewals scheduled for the summer of 1937 were only 150 ties to the mile, which would indicate that the ties are in good shape and in the average condition for that class of track.

Assistant Engineer Whitman inspected the track eastward from milepost 284, including a portion of the track torn up by the derailment. Cross levels were checked with the section foreman's level, but nothing unusual was found; there was a variation of 1/4 inch at some places and 1/2 inch at others. The superelevation seemed to be fairly consistent, although on the portion of track that had been repaired he found variations of 1 inch in one or two joints, which may have been caused by shimming when the track was rebuilt. The general condition of the ties was from good to fair, being average track for the amount of traffic handled. There were some loose spikes. There had been a little high water, but the ties were frozen solidly and there was no indication that they had moved. The track was badly damaged by the derailment and it could not be determined where the individual rails had originally been located in the track. In his opinion the track spread sufficiently to allow the left wheels to drop off the rail, which exerted enough pressure on the opposite flange to overturn the right rail but it was hard to determine just where this occurred.

The track was found to gauge wide, being $1\frac{3}{4}$ inches wide at one point; the cross levels were consistent for this type of track, and some track fastenings and spikes were loose, but there was no hazardous condition. He did not think that the accident would necessarily have been averted had the curve been fully tieplated, although this would have helped to prevent lateral movements.

Vice President and General Manager Whitman said that the rail in this vicinity was laid new in the year 1887.

The last train to pass over the track involved was west-bound mixed Train No. 251, which passed that point at a speed of about 25 to 30 miles per hour about 5 hours prior to the accident, at which time members of that crew noticed nothing unusual.

During the 29-day period prior to the accident there was a total of 86 train movements, or an average of approximately 3 trains per day.

Engine 801, of the 2-6-2 type, has a driving wheel base of 11 feet 4 inches, and a total wheel base, engine and tender, of 55 feet 8 inches; the diameter of the driving wheels is 63 inches. Weight on engine truck, 20,000 pounds; on drivers, working order, 132,760 pounds; on trailing truck, 38,560 pounds; weight of tender, loaded, 112,860 pounds; total weight engine and tender 310,180 pounds. There was nothing found about the condition of the engine or tender that would have caused or contributed to the accident.

At the time the Commission's inspectors made an inspection of the track, considerable repair work had been performed and much of the equipment removed from the scene. The track was damaged for a distance of 360 feet, and 330 feet had to be renewed. Inspection was made for a distance of approximately 1 mile on each side of the point of accident. The ties were very badly decayed, rail fastenings were loose and from 8 to 10 spikes could be removed by fingers from each rail length. The gauge varied from $1\frac{1}{4}$ to 1 inch wide; the track levels were fairly consistent for this type of track. There was an average of 6 tieplates to the rail length, but under the majority of joints there were no plates; there were 4 rail anchors to the panel. The exact point of derailment was not determined. The first flange mark continued on the ties about 6 inches inside the gauge of the low rail of the curve for a distance of about 68 feet, from which point eastward the track had been renewed.

Discussion

Examination of the track disclosed it to be in poor condition; ties were badly decayed, rail fastenings loose, spikes could be removed by hand, the gauge was wide at different points, being $1\frac{3}{4}$ inches wide at one point and the superelevation of the curve involved varied as much as 1 inch at some rail joints. Cross levels checked fairly well, with a variation of $1/4$ to $1/2$ inch at some points. Drainage trouble was experienced with heavy snow. The 60-pound rail was laid new in the track 50 years ago. Nothing was found about the condition of the engine, tender or cars that would have caused or contributed to the accident, and there was no indication of excessive speed. One track foreman was assigned alone to 14 miles of main track and 1 mile of sidings, extra labor being furnished only during certain periods of the year or when specially requested. It appears that the track spread and that the north wheels of the engine dropped to the ties inside the gauge of the north rail while the south wheels rode on the web of the south rail which overturned ahead of the engine for a distance of about 220 feet until a rail broke, precipitating the general derailment.

Conclusions

This accident apparently was caused by spread track and the high rail of the curve turning over, due to bad track conditions.

Recommendations

It is recommended that track on this line be placed in condition to provide for the safe movement of trains and that an adequate degree of maintenance be provided.

Respectfully submitted,

W. J. PATTERSON,

Director.