INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT WHICH OCCURRED ON THE GREAT NORTHERN RAILWAY NEAR SCENIC, WASH., ON FEBRUARY 15, 1932.

April 27, 1932.

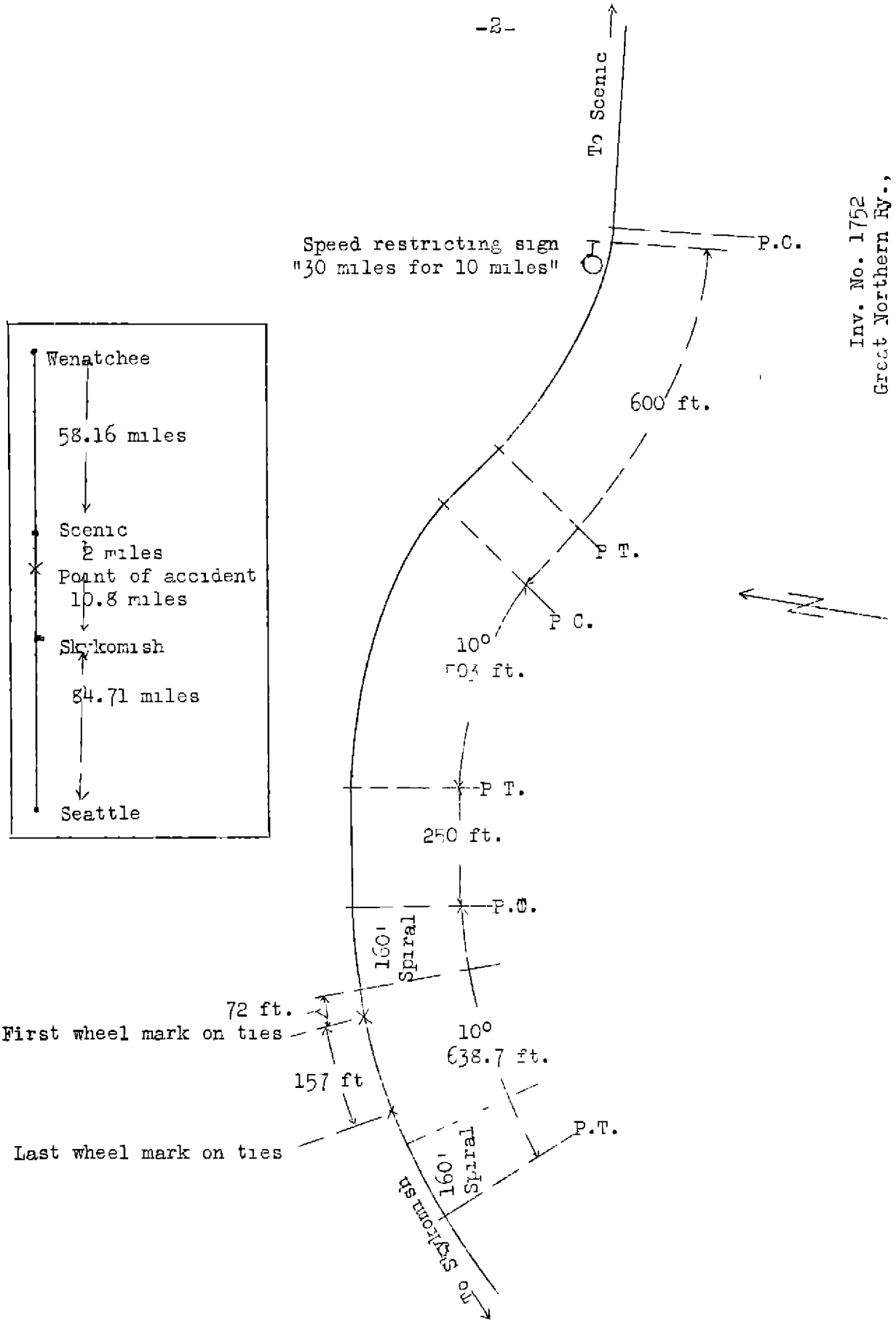
To the Commission:

On February 15, 1932, there was a derailment of an engine pushing a snow dozer on the Great Northern Railway near Scenic, Wash., which resulted in the death of one employee and the injury of one employee. This accident was investigated in conjunction with a representative of the Department of Public Works of the State of Washington.

Location and method of operation

This accident occurred on the Second Subdivision of the Spokane Division, extending between Wenatchee and Seattle, Wash., a distance of 155.67 miles, in the vicinity of the point of accident this is a single-track electrified line over which trains are operated by time-table, train orders, and an automatic block-signal system, the engine involved in this accident, however, was a steam engine. The accident occurred about 2 miles west of the depot at Scenic, approaching the point of accident from the east, there is a 10° curve to the left 503 feet in length, including spirals, and then 350 feet of tangent, followed by another 10° curve to the left 638.7 feet in length, including spirals, each spiral being 160 feet in length, and the first mark of derailment appeared on this last-mentioned curve at a point 72 feet west of the east spiral. The grade is descending for westbound trains, varying from 1.8 to 2.2 per cent, and is at its minimum at the point of accident. There is a speed restricting sign, reading "30 miles for 10 miles", located on the north side of the track at a point 600 feet east of the first mentioned 10° curve or 1,585 feet east of the initial point of derailment. There is a slope on the north side of the track which extends several hundred feet down to the valley below, while mountains rise on the south side of the track. The track is laid with 130-pound rails, 33 feet in length, with 20 ties to the rail-length, tie-plated, double-spiked, and ballasted with sand and gravel, four anti-creepers are used to each rail. The gauge, alinement and surface were good, and the track was well maintained, the superelevation of the outside rail of the 10° curve involved was 3 inches.

The weather was clear and it was cold at the time of the accident, which occurred about 1.32 p. m.



Inv. No. 1752
Great Northern Ry.,
Scenic, Wash.
Feb. 15, 1932

Description

Westbound work extra 1140 consisted of snow dozer No. X-1643, pushed by engine 1164, of the 2-8-0 type, and was in charge of Conductor Fransen and Engineman Heatherington. Work extra 1140 was en route from Scenic to Skykomish, 12.8 miles west thereof, and was traveling at a speed estimated to have been between 25 and 30 miles per hour, when the tender became derailed, which in turn pulled the engine and snow dozer off the track.

Engine 1140 and its tender slid down the slope on the north or outside of the curve to a point 62 feet below the grade, the engine stopping at right angles to, 78 feet from, and headed toward the track, on its right side, 350 feet west of the first wheel mark on the ties, the tender was also on its right side, east of and against the engine. The snow dozer remained upright on the track, with its rear end off its truck on the north side of the track. The employee killed was the engineman, while the employee injured was the fireman.

Summary of evidence

Fireman McLellan stated that after leaving Scenic, at about the speed-restricting sign, the engineman made a light air-brake application, in order to steady the train around the curve, and then released. The engine did not pick up speed as expected, and Engineman Heatherington remarked that the retainer probably was turned up on the dozer and that he would have to work steam lightly, which was done. By this time the work extra had almost reached the curve involved and the first the fireman knew of anything wrong was when he heard something snap, like the breaking of a bolt, and on looking back he saw that the tender was derailed, he shouted a warning of danger to the engineman, who applied the air brakes in emergency. The engine was pulled from the track by the derailed tender and they both broke away from the dozer and started down the slope. Fireman McLellan estimated the speed to have been between 27 and 30 miles per hour at the time of the accident. Fireman McLellan had worked on the snow dozer every winter for the past 18 or 20 years, and he said that on the trip in question no uneven train action or surge was experienced, due to the wings or flanges of the dozer encountering snow or ice, nor was there any unusual side sway or oscillation of the tender. He further stated that the engineman had always used good judgment in operating the engine and snow dozer, carefully complying with the speed restrictions and properly controlling the movement around curves.

Conductor Fransen, Brakemen Seager and Weedin, and Section Laborers Nelson and Evanhoff were riding in the snow dozer at the time of the accident. The conductor said that as there was no snow of consequence to be plowed out along the main track while en route to Skykomish, it having been cleared out the night before, the retainer on the dozer had been turned up, the only reason the nose and wings of the dozer were down was that a little snow would roll back in the cuts and he wanted to clear them out. The first he knew of anything wrong was when he felt a jerk back on the dozer, and then the engine tipped the dozer and broke away, he estimated the speed at the time to have been between 25 and 30 miles per hour, and said the air brakes had worked properly and that they had been applied and released before the curve had been reached. Conductor Fransen had worked on the snow dozer every winter since the year 1912, he said that it was handled the same on this trip as it had been in the past and that the speed was not excessive, he did not know what caused the derailment. Statements of the brakemen and the section laborers corroborated those of the conductor, they stated that the speed was not excessive, and that there was no unusual vibration or motion of the snow dozer, which was being operated in the usual manner.

Assistant Engineer Hastie made careful examination of the track subsequent to the accident, the alinement and gauge were uniform, the superelevation of the outside or high rail of the curve was 3 inches, and the track structure was maintained in good condition. Mr. Hastie further stated that he had spent a considerable portion of the previous year in establishing speed-restriction boards and proper elevation for curves over the entire western district, based on the AREA standards, according to the table, AREA 1929 proceedings, vol. 30, p. 916, the overturning speed on a curve of 10° with 3 inches superelevation would be 57 miles per hour, while a safe speed would be 36 miles per hour, and Mr. Hastie said that the 30-miles-per-hour speed-restriction board located east of the point of accident provided for a comfortable speed around curves in the territory affected. In this connection it is noted that 30 miles per hour is the rate shown in the table as the comfortable speed on a curve of 10° with 3 inches superelevation. Mr. Hastie stated, however, that the overturning speeds were based on an absolutely rigid track construction which did not prevail in actual practice, and that it had been established by experience in previous cases, where the speed at the time of derailment had been shown by a speed recorder, that when the speed reached 40 or 45 miles per hour on a curve of this degree and amount of superelevation the danger zone had been reached.

Master Mechanic Clark and Traveling Engineer Nugent arrived at the scene of the accident the morning after its

occurrence. Careful examination of the engine and tender as to lateral, wheel flanges, treads, brake rigging, running gear, splash boards in the tender cistern, etc., disclosed no defect that would have caused the derailment. The top arch bar on the right side of the forward truck was broken, and showed an old flaw, but it was thought to have broken after the tender was derailed. There were marks on the outside of the right tender-truck wheels indicating they had rubbed against the gauge side of the rail. Statements of Derrick Foreman Nagle brought out nothing additional of importance.

Superintendent McDonough, Assistant Engineer Hastie, General Roadmaster Hess, Master Mechanic Clark and Traveling Engineer Nugent were of the opinion that the accident was caused by excessive speed, District Roadmaster Torkelson could not say what caused the accident.

Examination of the track by the Commission's inspectors disclosed that the first wheel mark on the ties was on the gauge side of the north or outside rail of the curve at a point 72 feet west of the east spiral. The indications were that the wheels of the front tender truck were derailed at this point, marking the ties, the spike heads were also marked or broken off for a distance of several feet on the gauge side of the outside rail and this rail was kinked near its leaving end. The ties and spikes were marked on the gauge side of the north rail for a distance of 157 feet west of the first mark on the ties, and then marks appeared on the outside of the north rail. Faint marks were found in the snow in two different places on the outside of the south rail, apparently flange marks, indicating that the south side of the tender was held in suspension until the tender reached the location of a wooden pole, which is on the north side of the track at a point 92 feet west of the first mark and supports the overhead electric catenary wires, the tender struck this pole a glancing blow at a point 10 feet above the ground, indicating that the tender was leaning considerably to the right or north. Apparently the tender then tipped over, at a point 47 feet west of the pole, causing the engine to be pulled off the track from the rear, the last wheel mark on the ties appearing at a point 18 feet beyond where the tender tipped over. In starting its slide down the mountain side, the engine apparently broke off the first catenary pole west of the pole that was struck by the tender, the snow dozer then being pulled from the track by the engine and stopping on the west spiral of the curve, opposite the second catenary pole beyond the one struck by the tender. The rear end of the dozer was 285 feet west of the first wheel mark on the ties, and 128 feet west of the last wheel mark on the ties.

Engine 1140 is of the 2-8-0 type, burning oil, having a total weight, engine and tender, loaded, of 343,200 pounds, the driving wheel-base of the engine is 16 feet, while the wheel base of the tender is 20 feet 7 inches. The tender is of the rectangular type, being a converted coal-carrying tender, and has a loaded weight of 148,200 pounds, with a capacity of 8,000 gallons of water and 4,825 gallons of oil, it is equipped with splash boards. Careful examination of the engine and tender disclosed no defect that could have caused the accident.

Conclusions

The cause of this accident was not definitely ascertained.

This accident occurred on a curve of 10° on which a superelevation of 3 inches is maintained in accordance with the usual practice of this carrier in this particular territory and it also appeared that the speed for a distance of 10 miles is restricted to 30 miles per hour by a sign located about a quarter of a mile east of the point of accident, and that there is a further restriction of 20 miles per hour for freight trains between Scenic and Skykomish, within which territory this accident occurred. There is no evidence that the speed exceeded 30 miles per hour, and while there is no question but that it did exceed 20 miles per hour, there was evidence to the effect that it was customary and often necessary to operate a snow dozer at a higher rate of speed in order to enable it to perform its work properly. A careful examination of the equipment failed to disclose anything which it was thought could have contributed to the accident, there was a broken arch bar on the forward tender truck and the surface of the fracture indicated the presence of an old flaw, but it was thought that this arch bar broke after the tender had been derailed. The evidence indicated, however, that the tender was the first to be derailed and it is possible that the speed was higher than estimated by the employees involved and that with this type of equipment the superelevation did not provide a sufficient margin of safety for this higher rate of speed.

All of the employees involved were experienced men and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. BORLAND

Director.