INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE SOUTHERN RAILWAY NEAR HOT SPRINGS, N.C., ON DECEMBER 12, 1933.

February 13, 1934.

To the Commission:

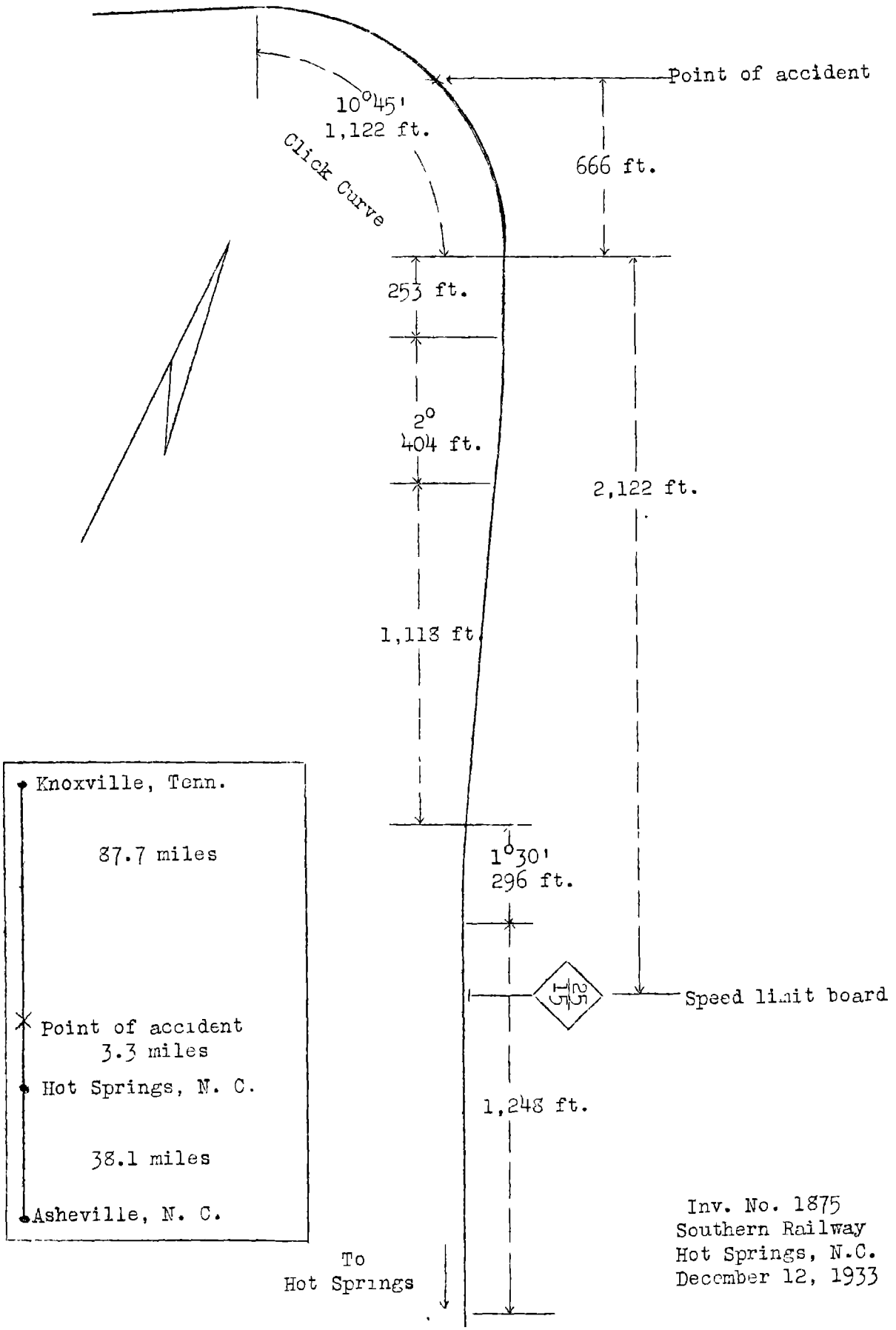
On December 12, 1933, there was a derailment of a passenger train on the Southern Railway near Hot Springs, N.C., which resulted in the death of 1 employee, and the injury of 27 passengers, 4 employees, 3 mail clerks, 1 express messenger, 1 Pullman porter and 3 dining car employees.

Location and method of operation

This accident occurred on that part of the Memphis & Charleston District of the Knoxville Division which extends between Asheville, N.C., and Knoxville, Tenn., a distance of 129 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 and train-stop system, the latter being of the intermittent-inductive type. This accident occurred on what is known as "Click Curve" at a point approximately 3.3 miles west of Hot Springs; approaching the point of accident from the east, the track is tangent for a distance of approximately 1,248 feet, followed by a 1° 30' curve to the right 296 feet in length, tangent track for a distance of 1,118 feet, a 3° curve to the left 404 feet in length, tangent track for a distance of 253 feet, and then a 10° 45' curve to the left 1,122 feet in length, including spirals at either end of 173 feet, the accident occurring on this last-mentioned curve at a point about 666 feet from its eastern end. The grade for west-bound trains was generally descending, it being 0.318 percent at the point of accident.

The track is laid with 130-pound rails, 39 feet in length, with an average of 23 or 24 ties to the rail-length, fully tieplated and spiked, with four rail anchors and four gauge rods to each rail length. The track is ballasted with limestone chatt and is well maintained. The curve on which this accident occurred is one of the points at which the Southern Railway is testing two different kinds of rails and for that reason it is carefully checked each week for elevation, alinement and wear on the rails.

The Knoxville Division is one of the heaviest tonnage divisions in that section, and to facilitate the handling of freight trains which had a tendency to be derailed at slow speeds on curves with high elevation, the elevation on Click Curve was lowered some years previously and a speed-limit sign is located on the north side of the track approximately 2,122 feet east of the curve restricting the speed on this curve to 25 miles per hour for passenger trains and 15 miles for freight trains.



Inv. No. 1875
Southern Railway
Hot Springs, N.C.
December 12, 1933

There was a light mist and fog at the time of the accident, which occurred between 7:30 and 7:34 p.m.

Description

West-bound passenger Train No. 27 consisted of 1 mail and baggage car, 1 express car, 1 combination baggage car and coach, 1 coach, 4 Pullman sleeping cars, and 1 dining car, all of steel construction, hauled by engine 1490, and was in charge of Conductor Miller and Engineman Houchins. This train departed from Asheville, 38.1 miles east of Hot Springs, at 6:07 p.m., according to the train sheet, 27 minutes late, left Hot Springs, 3.3 miles east of the point of accident, at 7:26 p.m., 29 minutes late, and was derailed on rounding Click Curve while traveling at a speed estimated to have been between 40 and 50 miles per hour.

The engine overturned to the right or outside of the curve, and after making a complete revolution landed in an upright position at the foot of an 8-foot embankment, with its head end 141 feet beyond the point of derailment and 28 feet from the center line of track and the rear end 57 feet from the track; the tender landed upside down, to the rear of the engine, with its forward truck intact. The first car stopped between the engine and the track, leaning at an angle of 45°; the second car stopped upright diagonally across the track with its front end 157 feet beyond the point of derailment. The third car was on its right side behind the tender with its front end about 60 feet and its rear end about 27 feet from the track. The fourth car followed the third car down the embankment, stopping at an angle of 45° with its rear end approximately 5 feet from the track. The engine was not seriously damaged, although the cars above-mentioned were considerably damaged. The remaining cars were not derailed with the exception of the two right front wheels of the fifth car, this car striking the second car which was across the track. The employee killed was the engineman, and those injured were the conductor, fireman, flagman and baggageman.

Summary of evidence

Fireman Harrison stated that as they left Hot Springs the engineman commented about being late; they were traveling fast and he was lost temporarily and did not know for a moment just where they were until the engine swerved and then settled back; the engineman reached for the brake valve and the fireman started to call to him but the engine turned over before he could do so. Fireman Harrison stated their speed was about 50 miles per hour; he thought the engineman also might have misjudged his location as he did not apply the brakes between Hot Springs and Click Curve, and he said the engineman was not in the habit of entering this curve without applying the brakes.

Conductor Miller noticed no unusual speed between Asheville and Hot Springs and said Engineman Houchins handled the train nicely. The highest speed attained after leaving Hot Springs was 40 or 45 miles per hour, when they were about 3/4 mile east of Click Curve, and he did not recall any application of the air brakes after leaving Hot Springs; nevertheless he thought the train entered the curve at 25 or 30 miles per hour, but was basing this estimate on past performances. The first intimation he had of anything wrong was when the car in which he was riding, the third car in the train, started to sway, went up a little, then jammed and threw him forward; the car then settled on its side. As soon as he was able to do so he asked Flagman Frye to look at the time, as he had lost his glasses, and it then was 7:37 p.m; he did not know how long this was after the accident, his estimates as to the time which had elapsed varying from 3 to 4 minutes. He made an investigation for the purpose of ascertaining the cause of the accident, and judging from the position and condition of the wreckage he was of the opinion that the accident was due to excessive speed. Conductor Miller stated that the air brakes had been properly tested at Asheville and that he had talked with Engineman Houchins at that point, the engineman appearing to be normal in every way; he could not remember of Engineman Houchins having violated speed restrictions previously and considered him a safe engineman.

Flagman Frye noticed no unusual speed at any time until they entered the curve on which the accident occurred and then it was evident that the speed of the train was excessive. He was standing in the aisle of the third car when it began to lean toward the outside of the curve, lurched a couple of times, and then turned over. After the accident he looked at his watch and it was 7:37 p.m. and he thought that the accident occurred between 7:30 and 7:35 p.m. Flagman Frye went back to flag and on looking over the track with a lighted fusee he did not see any marks which would indicate the cause of the accident; it was very dark and there was a fog; he thought it possible that the engineman could have lost his bearings, as he himself did not know exactly where he was until he could get away from the derailment and look around.

Baggageman Farmer, who also was riding in the third car, stated that he noticed no unusual speed until they entered Click Curve; he did not notice an application of the air brakes after leaving Hot Springs. He inspected the track after the accident but found no marks of any kind east of the scene of the accident.

Section Foreman McDaris, in charge of this section of track, stated that he gives this curve special attention due to its being specially constructed to test rail, and that the track was in very good condition. He had last been over it at 9.a.m. on the day of the accident. On reaching the scene of the accident about 1 hour after its occurrence he examined the track but could not find any condition that would have caused the accident.

Track Supervisor Hazelwood arrived at the scene of the accident about 1½ hours after its occurrence; on examining the track and equipment he could find nothing that might have caused the accident. The ends of the ties were damaged by the cars as they were derailed down the embankment, but the only repairs necessary to be made to the track before moving trains over it was the spiking of the outer rail where the express car had torn out the spikes, and alining the track where it had been knocked slightly out of alinement. He stated that a train could pass safely around this curve at a speed of 40 miles per hour, but that it was not safe for a speed of 50 miles per hour.

Roadmaster Moore and Engineer Maintenance of Way Bennett stated that their inspections of the track and equipment disclosed nothing that could have caused the accident, and they concluded from the position of the equipment after the accident, and in the absence of any marks on the track to indicate a derailment prior to the time the engine turned over, that the accident was caused by the train entering the curve at too high a rate of speed. Maintenance Engineer Bennett stated that the elevation on this curve was 3¾ inches and was uniform. This line is a heavy freight tonnage line and the elevation was lowered and maintained for that tonnage, the passenger train speed being controlled to suit the freight train requirements. It is the practice for curves to be elevated for a speed of at least 10 miles per hour above that allowed by the speed-limit sign and this curve was safe for a speed of 40 miles per hour, but not for a higher rate of speed.

Master Mechanic Simpson examined engine 1490 after the accident and found its general condition good, while the damage was such that by using a cab and tender from another engine, he thought it could be placed in first-class condition and ready for service within a period of 5 days.

Superintendent Burchfield arrived about 11 p.m. and at once made a thorough examination of the track but found no wheel marks, no evidence of anything dragging, and no evidence of anything having been placed on the rail. He added that the services of Engineman Houchins had been satisfactory, but that he had been experiencing family and financial troubles, causing him considerable anxiety and that this might have diverted his mind momentarily.

The engine crew of east-bound Train No. 102 stated that as their train passed around Click Curve at a speed of 25 miles per hour, about 6:50 p.m., they noticed nothing unusual. They considered a speed of 40 miles per hour on this curve to be unsafe, and they estimated a reasonable length of time for a passenger train to run from Hot Springs to Click Curve would be from 4 to 5 minutes.

Examination of the track by the Commission's inspectors revealed no evidence of anything dragging, no flange marks, or anything else that could have contributed to the cause of the accident. The track was in good condition and no repairs had been made with the exception of a few spikes and a few ties renewed. On the outside of the curve for a distance of 6 or 7 rail lengths

the ends of the ties had been splintered, but there were no flange marks or marks of any other nature that would indicate derailment. The smoke stack and sand dome of the engine were found where they had been driven into the ground at a point about 24 feet from the track, this apparently having been done as the engine was turning over. Examination of engine 1490, of the 4-8-2 type, disclosed the valve motion, wheels, rods, foundation brake rigging, pump and connecting pipes to be in good condition with the exception of the left eccentric rod, which was slightly bent. The appurtenances on the top of the engine were torn off, the cab was mashed downward and there was a section of it attached to the engine on the right side which was intact and on which the paint was not scratched or scarred in any manner; judging from the evidence at the scene of the accident it appeared that the engine left the track in a straight line and did not encounter anything until it first struck the ground bottom up.

Conclusions

This accident was caused by excessive speed on a sharp curve.

The speed for passenger trains on this curve is restricted to 25 miles per hour, but the fireman estimated that the speed was 50 miles per hour at the time of the accident, and Conductor Miller estimated the speed at 40 or 45 miles per hour when 3/4 mile from the curve and did not notice any application of the brakes prior to the accident; the statements of the other surviving members of the crew were also to the effect that no application of the air brakes was made between Hot Springs and the point of accident, although the grade is descending for a considerable distance. In the absence of flange marks on the track and considering the position and condition in which the equipment stopped, the engine first striking the ground bottom up and making a complete revolution before stopping in an upright position, it is believed that the engine turned over from centrifugal force due to excessive speed. Practically no damage was sustained by the track, and there was no evidence of dragging equipment or of an obstruction of any kind on the rails.

Respectfully submitted,

W. P. BORLAND,

Director.