

INTERSTATE COMMERCE COMMISSION
WASHINGTON

ACCIDENT NO. 2571
THE NORTHEAST, CHATTANOOGA & ST. LOUIS
RAILWAY COMPANY
REPORT IN RE ACCIDENTS
AT HOOVER, GA., ON
MARCH 1, 1942

- 2 -

SUMMARY

Railroad: Nashville, Chattanooga & St. Louis

Date: March 1, 1942

Location: Hooker, Ga.

Kind of accidents: Derailments

Trains involved: Freight : Passenger

Train numbers: First 57 : 95

Engine numbers: 659 : 567

Consist: 36 cars, caboose: 14 cars

Speed: 35-45 m. p. h. : 30 m. p. h.

Operation: Timetable, train orders and
automatic block-signal system

Track: Double; 6°38' curve to left; 1.21
percent descending grade southward

Weather: Clear

Times: About 2:18 and 2:25 p. m.

Casualties: 2 killed; 1 injured

Causes: First accident caused by irregular-
ity in surface and alinement of
track combined with excessive
speed on curve, and second acci-
dent caused by irregularity in
surface and alinement of track
combined with weakened track
structure as result of first de-
railment

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2574

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910

THE NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY COMPANY

April 25, 1944.

First accident at Hooker, Ga., on March 1, 1944, caused by irregularity in surface and alignment of track combined with excessive speed on curve, and second accident caused by irregularity in surface and alignment of track combined with weakened track structure as result of first derailment.

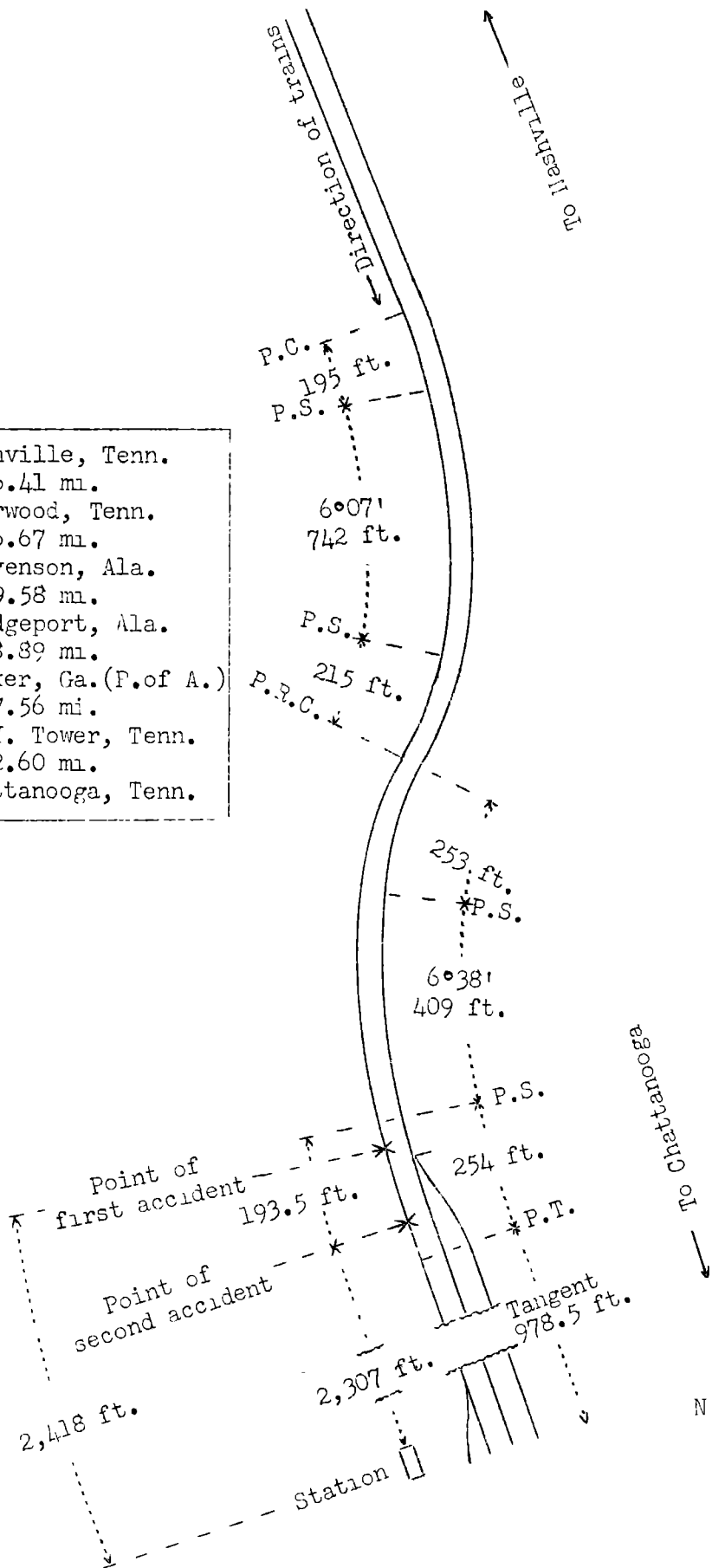
REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On March 1, 1944, there were derailments of a freight train and a passenger train on the Nashville, Chattanooga & St. Louis Railway at Hooker, Ga., which resulted in the death of two employees and the injury of one employee.

¹Under authority of Section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

- o Nashville, Tenn. 96.41 mi.
- o Sherwood, Tenn. 16.67 mi.
- o Stevenson, Ala. 9.58 mi.
- o Bridgeport, Ala. 18.89 mi.
- X Hooker, Ga. (P. of A.) 7.56 mi.
- o N. Y. Tower, Tenn. 2.60 mi.
- o Chattanooga, Tenn.



Inv-2574
N., C. & St. L. Ry.
Hooker, Ga.
March 1, 1942

Location of Accident and Method of Operation

These accidents occurred on that part of the Chattanooga Division which extends between Nashville and Chattanooga, Tenn., a distance of 151.71 miles. In the vicinity of the points of the accidents this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. At Hooker the northward siding parallels the northward main track on the east and the southward siding parallels the southward main track on the west. The southward siding is 4,007 feet in length. The north siding-switch of the southward siding is 473 feet north of the station. The first and second accidents occurred on the southward main track at points, respectively, 2,418 feet and 2,307 feet north of the station at Hooker. As the points of the accidents are approached from the north there are, in succession, a 6°07' curve to the right 1,152 feet in length, a spiral to the left 253 feet, a 6°38' curve to the left 409 feet and a spiral to the left 254 feet. The derailments occurred on the latter-mentioned spiral at points 171.5 feet and 60.5 feet from its southern end. Throughout a considerable distance south of the points of the derailments there are numerous short curves and tangents. The grade for south-bound trains varies between 0.91 percent and 1.21 percent descending throughout a distance of 2,291 feet to the points of the accidents, and is 1.21 percent at the points of the accidents.

On the curve involved the track structure consists of 110-pound rail, some of which were rolled in 1928 and the remainder in 1934. 39 feet in length, laid on 21 or 22 treated hardwood ties to the rail length; it is fully tieplated, single-spiked, and is provided with 6 to 8 rail anchors per rail length. At the points of the accidents the track is ballasted with crushed limestone. The maximum superelevation on the curve involved was 5-3/8 inches. At the point of the second accident the superelevation was 2-1/2 inches and the gage was 4 feet 8-1/2 inches.

Between points 616 feet and 344 feet north of the point of the first accident the track is laid on a cinder fill, the maximum height of which is 12 feet. Throughout this distance the track is ballasted with cinders.

Operating rules read in part as follows:

LOCOMOTIVES.

508. * * *

If reason to believe that train has passed over any dangerous defect, stop and notify conductor.

A speed-limit sign bearing the numerals "30" is located 732.9 feet north of the north end of the curve involved and

1,706 feet north of the point where the first derailment occurred. The maximum authorized speed for passenger trains at other points in this vicinity is 60 miles per hour, and for freight trains, 40 miles per hour.

Description of Accident

First 57, a south-bound third-class freight train, consisted of engine 659, 36 loaded cars and a caboose. At Stevenson, Ala., 28.47 miles north of Hooker, the crew received copies of train order No. 561, Form 19, which read as follows:

No 9, Eng 567 run thirty five 35
mins late Stevenson to NY Tower

This train departed from Stevenson at 1:23 p. m., according to the dispatcher's record of movement of trains, 8 hours 48 minutes late, passed Whitfield, 4.03 miles north of Hooker and the last station where time is shown, at 2:02 p. m., 8 hours 33 minutes late. While this train was moving at an estimated speed of 35 to 45 miles per hour the front truck of the fourteenth car was derailed to the left at a point 2,418 feet north of the station at Hooker. The train stopped about 2:20 p. m. with its rear end standing at a point about 6,600 feet south of the point of derailment. The conductor immediately proceeded toward the rear to flag No. 95 and to inform the crew of that train of track conditions, but before he reached the point of derailment No. 95 became derailed.

No. 95, a south-bound first-class passenger train, consisted of engine 567, of the 4-8-4 type, one express car, one storage-mail car, one mail car, two express cars, one baggage car, three coaches, one Pullman sleeping car, one dining car and three Pullman sleeping cars, in the order named. All cars were of steel construction. A terminal air-brake test was made at Nashville, 141.55 miles north of Hooker, and the brakes functioned properly en route. This train departed from Nashville at 10:44 a. m., according to the dispatcher's record of movement of trains, 14 minutes late. At Sherwood, Tenn., 45.14 miles north of Hooker, the crew received copies of train order No. 561, Form 19, previously quoted. This train departed from Sherwood at 1:18 p. m., 40 minutes late, passed Bridgeport, Ala., 19.39 miles north of Hooker and the last open crossing, at 1:58 p. m., 71 minutes late, and while moving at a estimated speed of 30 miles per hour it was derailed at a point 2,307 feet north of the station at Hooker.

Because of track curvature in the immediate vicinity of the points where these accidents occurred, the view of the track ahead from the cab of a south-bound engine is restricted to about 200 feet.

Engine 567 and its tender, remaining coupled, were derailed to the left, continued forward 272 feet and stopped on their left sides with the front end of the engine on the southward main track and the rear end on the northward siding. The engine truck was broken and the cab was damaged. The first car was derailed to the right and stopped 325 feet beyond, with its front end on the roadbed and its rear end down the embankment. The second car was derailed to the right and stopped 50 feet beyond, upright, with its front end down the embankment and its rear end on the southward main track. The third car was derailed to the left and stopped upright, considerably damaged, across both main tracks and the northward siding. The fourth, fifth and sixth cars were derailed but remained upright and in line with the southward main track.

It was clear at the time of these accidents, which occurred about 2:18 and 2:25 p. m.

The employees killed were the engineer and the fireman of No. 95, and the employee injured was the flagman of First 57, who was on the engine of No. 95.

Mechanical Data

After the accident an inspection of engine 567, of No. 95, disclosed that all flange heights except the front No. 1 trailer-wheel tire were correct and the heights were within the prescribed limits. All driving-box wheels were well lubricated and free to turn. The back-to-back measurements of engine-truck wheels, and the driving- and trailing-wheel tires and the lateral action of the wheels conformed to the prescribed requirements. The splash plates of the tender were in place. The automatic brake valve was in emergency position, the independent brake valve in running position, the reverser lever in position for forward motion at short cut-off and the throttle was half open.

The total weight of engine 567 in working order is 381,000 pounds, distributed as follows: Engine truck, 65,500 pounds; driving wheels, 200,000 pounds; and trailer truck, 95,500 pounds. The diameters of the engine-truck wheels and the driving wheels are, respectively, 33 inches and 40 inches, and of the trailer-truck wheels, 30 inches and 43 inches. The tender is of the Vanderbilt type and is equipped with two four-wheel trucks. The weight of the tender load is 194,000 pounds. The rigid wheelbase of the engine is 12 feet 3 inches, and the total length of the wheelbase is 44 feet 3 inches. The total length of the engine and tender is 93 feet 8 inches.

Inspection of engine 569, of First 57, disclosed no condition which might have contributed to the misalignment of the track.

The car which was derailed in the train of First 57 was a C. B. & Q. R. R. steel box car. The front truck is of the Bettendorf type, equipped with lateral bolsters, roller side-bearings spaced 52 inches apart, and spring planks upon which are mounted coil springs in cluster. The front wheels of the front truck are 33-inch, single-plate, cast iron, and were manufactured by the Griffin Wheel Company on December 13, 1940, for the Northern Pacific Railway. Inspection of this car disclosed that the side-bearing clearance at each side of both trucks was 1/8 inch, the wheel flanges were of full contour, and there was no indication of center binding or fouling of the truck. The foundation brake gear was in place and secure. There was no indication that the brake had been applied for excessive periods. After the accident the front wheels of the front truck were found to be derailed; however, there were indications that all four wheels had been derailed but the rear pair of wheels was rerailed before First 57 stopped. The right front wheel of the front truck was moved inward on its seat 5/8 inch. This wheel was cracked from the hub outward through the tread. There was no mark to indicate that the wheel had revolved on the wheel seat. The wheel bore numerous marks indicating that it had struck portions of the track structure with considerable force. The right back wheel of the front truck bore marks of having slid on the rail.

Track Data

Measurements of the track taken throughout a distance of 504.5 feet immediately north of the point of the second derailment were as follows:

Distance north of point of 2nd accident	Track displacement	Superelevation	Gage
Feet	Inches	Inches	
504.5**	0	5-3/8	4 ft. 8-1/2 in.
485.0		5-3/4	4 ft. 8-1/2 in.
465.5	0	5-1/4	4 ft. 9 in.
446.0		5-1/2	4 ft. 8-1/2 in.
426.5	1-3/4 west	5-1/4	4 ft. 9 in.
407.0		5-1/4	4 ft. 8-7/8 in.
387.5	2-7/8 "	5-1/8	4 ft. 9 in.
368.0		5-3/8	4 ft. 8-7/8 in.
348.5	4-1/2 "	5-1/8	4 ft. 9 in.
329.0		5-1/2	4 ft. 8-1/2 in.
309.5	1 "	6-1/8	4 ft. 9 in.
290.0		5-3/4	4 ft. 8-1/2 in.
270.5	3-7/8 "	5-3/8	4 ft. 8-1/2 in.
251.0		5	4 ft. 8-1/2 in.
231.5***	1-3/8 "	5-1/4	4 ft. 9-3/8 in.
212.0		5-1/2	4 ft. 9-1/4 in.
192.5	1-1/2 "	5-1/2	4 ft. 9 in.
173.0		5-5/8	4 ft. 8-1/2 in.
153.5	7-3/4 "	4-1/2	4 ft. 8-5/8 in.

134.0		4-3/4	4 ft. 2-3/8 in.
114.0	5-5/8 west	4-1/8	4 ft. 2-5/8 in.
111.0***			
95.0		3-3/4	4 ft. 3-1/2 in.
75.5	4-3/4 "	3-5/8	4 ft. 8-5/8 in.
56.0		3-1/4	4 ft. 8-3/4 in.
36.5	4-3/4 "	2-7/8	4 ft. 3-3/4 in.
17.0		2-3/4	4 ft. 8-3/8 in.
Point of Derail-			
ment of No. 95	1/4 "	2-1/2	4 ft. 8-1/2 in.
North end of cinder fill *South end of cinder fill			
****Point of derailment of No. 57.			

Discussion

First 57 passed the top of the grade about 1-1/2 miles north of Hooker about 2:09 p. m. According to the order held by the crew of First 57, No. 95 was due to leave Whiteside, 4 miles north of Hooker and the last place to the rear where time was shown, at 2:13 p. m., and Hooker at 2:16 p. m. The speed of First 57 was about 10 miles per hour and the conductor instructed the flagman to flag No. 95, and to inform the engineer of that train that First 57 would either enter the siding at Hooker or proceed ahead of No. 95 to N. Y. Tower, 7.56 miles south of Hooker. After the flagman alighted, the conductor signaled that flag protection was being provided. The engineer partially closed the throttle and permitted the train to drift. According to the statement of the engineer, while his train was moving on the curve involved, where the maximum authorized speed was 30 m. p. h., the speed was about 35 miles per hour, the engine was riding smoothly, and the front brakeman, the fireman and he were maintaining a lookout ahead. Brake-pipe pressure of 90 pounds was being maintained. No brake application was made throughout a distance of about 1-1/2 miles on the descending grade, which averaged about 1 percent. When the engine reached a point about 180 feet north of the south end of the curve involved, the engine rolled laterally several times. The engineer made a brake-pipe reduction of about 8 pounds and, at a point about 1,100 feet farther south, as the engine and train appeared to be proceeding smoothly, he released the brakes. He looked back along his train several times but observed no indication of derailed equipment. Soon afterward the brakes were applied from the rear and the train stopped. Later it was found that the front pair of wheels of the front truck of the fourteenth car was derailed. According to statements of the front brakeman and the fireman, the engine rolled considerably on the curve involved but not more than a fine sand roll in this territory on previous occasions. According to the statement of the conductor, the speed of the train on the curve was 35 to 40 miles per hour and he was on the left side of the caboose maintaining a lookout ahead. He felt the train brakes apply and then release. He observed one of the rear cars rocking dangerously and when the caboose reached that point he thought it would overturn. He immediately opened the conductor's emergency

valve and, when the speed was reduced sufficiently he went back to warn the crew of No. 95 concerning the dangerous condition of the track. It was 2:20 p. m. when he started toward the rear. Before he could reach the point where the track was out of normal alinement, No. 95 was derailed.

The crew of a south-bound freight train which was the last train prior to First 57 and which passed over the track involved about 10:30 a. m. said the speed of their train was about 25 miles per hour and they observed no indication of irregularity of the track in question; however, the engine of First 57 rolled and thrust severely, apparently as a result of some irregularity which existed prior to the passage of the engine of First 57.

According to the statement of the flagman of First 57, who was on the engine of No. 95 as that train was approaching the point where the accident occurred, the speed was about 40 miles per hour, the enginemen were maintaining a lookout ahead and the throttle was about half open. The fireman informed the engineer that a signal, located 117 feet north of the point of accident, was displaying caution and the engineer made a service brake-pipe reduction. Immediately afterward the engine started to swing, and this action increased progressively until the engine was derailed. According to the statement of the train porter, he was maintaining a lookout ahead from the vestibule of the ninth car and observed the derailment of the engine. The train brakes were applied in service prior to the derailment, and were applied in emergency at the time the engine was derailed. Since both enginemen were killed in the accident it could not be determined if either one observed the track condition prior to the time the engine started to swing. Examination disclosed no condition of the engine of No. 95 existing prior to the accident which could have contributed to its cause. There was no indication of dragging equipment.

The front truck of the fourteenth car of First 57 became derailed to the inside of the leaving spiral of a 6°38' curve to the left when the train was moving at an estimated speed of 35 to 45 miles per hour at a point where the superelevation was 4-1/8 inches. The maximum authorized speed on this curve was 30 miles per hour. The first marks of this derailment were on the inside ends of the first, second and fourth angle-bar bolts on the high rail at a point 177 feet 8 inches north of the leaving end of the spiral. Flange marks appeared on the top of a tie 8 inches inside the gage side of the high rail at a point 6 feet 2 inches farther south. At a point 1 foot 11 inches farther south, a flange mark appeared on the top of a tieplate 6 inches outside the gage side of the low rail. There was no mark on the head of the low rail. Throughout a distance of 4,753 feet, flange marks appeared intermittently on the tops of the ties at a average distance of 9 inches inside the vest rail and 7 inches outside the gage side of the east rail

These marks indicated that a 4-wheel truck was derailed, and that the rear wheels became rerailed at the frog of the south switch of the southward siding. Only the front wheels of this truck were found derailed at a point 7,655 feet south of the point of derailment.

The first abnormal mark made by the engine of No. 95 was an abrasion on the gage side of the low rail 7 feet south of the point where First 57 was derailed. The mark was quite heavy and extended 4 feet southward. Beginning at a point 61 feet farther south the gage side of the low rail bore bearing marks throughout a distance of 10 feet 6 inches. Beginning at a point 4 feet 1-1/2 inches farther south the web of the low rail was marked a distance of 1 foot 11 inches. In this locality the inside spikes of the low rail had been pulled about half their length. At a point 19 feet 1 inch north of the point where No. 95 was derailed, the inside angle bar at a joint of the low rail was marked by wheels, the rail was bent outward and the inside spikes were pulled about half their length. Throughout a distance of 5 feet 2 inches south of this point, the gage side of the low rail was scored and abraded. At a point 8 feet 8 inches farther south, wheel marks appeared on the inside base of the rail throughout a distance of 5 feet 3 inches southward and pieces were broken out of the base. At the point of the second derailment the inside rail was broken. This was newly broken and the metal was sound. Opposite the break in the low rail the inside angle bar and angle-bar bolts at a joint in the high rail were marked and there was a flange mark 6 inches inside the gage side of the rail. From this point southward 435 feet of the southward main track was demolished during the general derailment. Throughout a distance of 738 feet north of the point where No. 95 was derailed the track was shifted to the west distances varying between 1/4 inch and 7-3/4 inches, and the gage side of the low rail was abraded at intervals. The gage varied between 4 feet 8-3/8 inches and 4 feet 9-1/2 inches. There was considerable irregularity in the surface of the curve north of the point where No. 95 was derailed. Between stations 329 feet and 309.5 feet north, the variation was 5/8 inch; between stations 173 feet and 153.5 feet north, the variation was 1-1/8 inches; and between stations 134 feet and 114.5 feet north, the variation was 5/8 inch. The track was shifted to the west at points north of the point of the second derailment, as follows: 304.5 feet, 1 inch; 270.5 feet, 3-7/8 inches; 192.5 feet, 4-1/2 inches; 153.5 feet, 7-3/4 inches; 114.5 feet, 5-5/8 inches; 56 feet, 4-3/4 inches; and point of derailment, 1/4 inch. According to the statement of the section foreman, the shifting of the track resulted in a series of short angles. These variations in surface and alignment would cause engines and cars to swing and to roll laterally. This action undoubtedly resulted in the fourteenth car of First 57 thrusting hard against the high rail, and about the instant the train brakes were applied the car rebounded toward the low rail and the front truck was snapped over the rail without marking it. As

result of the wheels chopping the ties near the outer spikes of the low rail, undoubtedly the seating of the tieplates on the rails was weakened. When the engine of No. 95 rolled and thrust laterally as a result of the irregular surface and alinement of the track, the weakened seating of the tieplates of the low rail permitted the low rail to cant outward and the right engine-truck wheels to drop inside the high rail.

According to the statements of the track supervisor and the section foreman in charge of the section involved, the work of reballasting and surfacing of the track in question and the reclin'ng of the track with the center stakes was completed February 13. During this work 151 ties were renewed. About 21 hours before these accidents occurred the engineer of a south-bound freight train filed a message that track irregularity existed on the curve involved. The section foreman was informed of this condition and about 1 hour later he raised the high rail $1\frac{1}{4}$ inch to $3\frac{3}{4}$ inch at a point about 370 feet north of the point where the car of First 57 was derailed. The section foreman said that because of a soft condition under the cinder fill on which the accident occurred, it is necessary to surface and to aline the track at intervals averaging about 10 days.

Cause

It is found that the first accident was caused by irregularity in surface and alinement of track combined with excessive speed on curve, and the second accident was caused by irregularity in surface and alinement of track combined with weakened track structure as a result of first derailment.

Dated at Washington, D. C., this twenty-fifth day of April, 1922.

By the Commission, Commissioner Patterson.

W. P. BARTEL

(SEAL)

Secretary.