

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3394

THE PENNSYLVANIA RAILROAD COMPANY

IN RE ACCIDENT

AT GARD, W. VA., ON

MARCH 9, 1951

SUMMARY

Date: March 9, 1951
Railroad: Pennsylvania
Location: Gard, W. Va.
Kind of accident: Derailment
Equipment involved: Engine and car
Engine number: 3527
Consist: 1 car
Estimated speed: 25 m. p. h.
Operation: Manual-block system; yard limits
Track: Single; 1° curve; 0.04 percent
ascending grade northward
Weather: Clear
Time: 11:06 p. m.
Casualties: 2 killed
Cause: Irregularities in surface and
alignment of track

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3394

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

THE PENNSYLVANIA RAILROAD COMPANY

May 22, 1951

Accident at Gard, W. Va., on March 9, 1951, caused by
irregularities in the surface and alinement of the
track.

REPORT OF THE COMMISSION¹

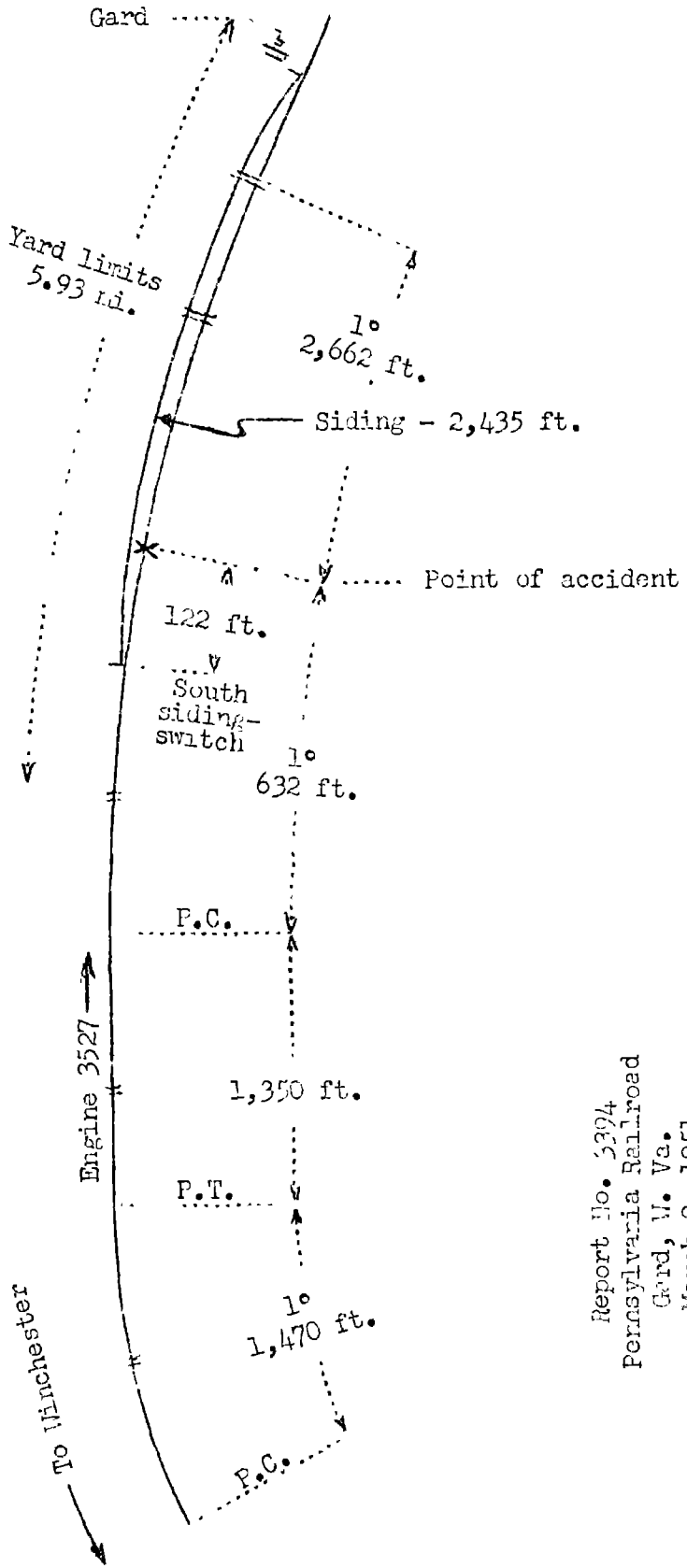
PATTERSON, Commissioner:

On March 9, 1951, there was a derailment of a yard
engine and car on the Pennsylvania Railroad at Gard, W. Va.,
which resulted in the death of two employees.

¹

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

X	Gard, W. Va.
	(Point of accident)
	4.0 mi.
o	Martinsburg, W. Va.
	22.1 mi.
o	Winchester, Va.



Report No. 5394
 Pennsylvania Railroad
 Gard, W. Va.
 March 9, 1951

Location of Accident and Method of Operation

This accident occurred on that part of the Philadelphia Division extending between Winchester, Va., and Gard, W. Va., 26.1 miles, a single-track line, over which trains are operated by a manual-block system. At Gard, 26.1 miles north of Winchester, a siding 2,435 feet in length parallels the main track on the west. Yard limits extend southward between Gard and a point about 2 miles south of Martinsburg, a distance of about 6 miles. The accident occurred on the main track at a point 122 feet north of the south siding-switch at Gard. From the south there are, in succession, a 1° curve to the right 1,470 feet in length, a tangent 1,350 feet and a 1° curve to the right 632 feet to the point of accident and 2,662 feet northward. The grade for north-bound trains is 0.33 percent descending throughout a distance of 1.08 miles, then it is 0.04 percent ascending 1,081 feet to the point of accident and 719 feet northward.

At the point of accident the track structure consists of 100-pound rail, 33 feet in length, laid in 1907. There are an average of 16 treated oak ties to the rail length. It is fully tieplated with single-shoulder tieplates and is spiked with three rail-holding spikes per tieplate. It is provided with 6-hole 32-inch joint bars, fully bolted. Rail anchors are not used. The track is ballasted with cinders to a depth of 12 inches below the bottoms of the ties.

The maximum authorized speed for the engine in backward motion was 25 miles per hour.

Description of Accident

Engine 3527, headed southward, moving in backward motion and pulling one car, departed from Martinsburg, 4 miles south of Gard, about 10:55 p. m. While it was moving on the main track at an estimated speed of 25 miles per hour, the leading wheels of the rear tender truck were derailed to the west at a point 122 feet north of the south siding-switch at Gard. These wheels continued in line with the track a distance of 32 feet northward, where the general derailment occurred.

The engine, the tender and the car overturned to the east and stopped approximately parallel to the track, with the rear end of the tender 251 feet 5 inches north of the initial point of derailment. The engine and the tender remained coupled. The tender and the car were off their trucks,

but the trucks remained on the track structure opposite their respective body bolsters. The engine, the tender and the car were somewhat damaged. The track was destroyed throughout a distance of approximately 200 feet north of the point of the general derailment.

The yard conductor and one yard brakeman were killed.

The weather was clear at the time of the accident, which occurred about 11:06 p. m.

Engine 3527 is of the 2-8-0 type. The total weight of the engine in working order is 251,000 pounds, distributed as follows: engine truck 27,700 pounds, driving wheels, 1, 2, 3, and 4, respectively, 62,300 pounds, 54,600 pounds, 55,700 pounds, and 50,700 pounds. The specified diameters of the engine-truck wheels and the driving wheels are, respectively, 33 inches and 62 inches. The rigid wheelbase is 17 feet 1/2 inch long, and the total wheelbase of the engine is 25 feet 9-1/2 inches long. A spring buffer assembly is arranged between the engine and the tender. The total length of the engine and tender coupled is 70 feet 2-7/8 inches. The engine is equipped with No. 6-ET brake equipment. It is not equipped with a speed indicating or recording device.

The tender is rectangular in shape and is equipped with two 4-wheel trucks. The trucks are spaced 17 feet 8 inches between centers. The wheelbase of each truck is 5 feet 10 inches long and the total wheelbase is 23 feet 6 inches long. The capacity of the tender is 17 tons of coal and 7,150 gallons of water. The total weight of the tender in working order is 160,600 pounds. The trucks have U-section cast-steel side frames and cast-steel bolsters with integral center plates having a vertical bearing surface of 1-1/4 inches. The side bearings are of the solid type and are spaced 50 inches between centers. Each spring group consists of one elliptical and two double-coil helical springs.

The last class 3 repairs of engine 3527 were completed January 19, 1951. The last monthly inspection was completed February 18, 1951. The last trip inspection was completed March 8, 1951, at Cumbo, W. Va.

Discussion

Yard engine 3527 was approaching the point where the accident occurred at an estimated speed of about 25 miles per hour. The enginemen were maintaining a lookout in the direction of movement from their respective positions in the cab. The yard conductor was seated on the seatbox behind the fireman,

and one yard brakeman was standing behind the engineer. The other yard brakeman was on the sill step and holding to the ladder on the west side of the car. The headlight on the rear of the tender was lighted brightly. The brakes of this engine had been tested and had functioned properly when used. The engineer said that he closed the throttle at a point approximately 1/2 mile south of the south siding-switch at Gard. He said that he felt an impact when the wheels of the rear tender-truck became derailed in the vicinity of the frog of the turnout. He immediately moved the automatic brake-valve handle to emergency position. The fireman said that he was looking in the direction of the movement, and that after the engine passed the south siding-switch the tender lurched suddenly toward the west and then lurched toward the east. He said that the engineer made an emergency application of the brakes, and he saw sparks flying from the front tender truck just before the engine overturned. The yard brakeman who was riding on the car said that he saw sparks from the wheels of the car and alighted from the west side of the car immediately before it overturned.

Examination of the engine after the accident occurred disclosed that the throttle was closed and the reverse lever was in position for backward motion at 40 percent cut-off. The independent brake valve was in running position and the automatic brake valve was in lap position. The engine truck and driving-wheel assemblies were in good condition. The contours of the flanges and treads of all wheels were within the limits prescribed by the carrier. All wheels were tight on their axles. All tires were tight on their wheel centers, and were parallel to their companion tires. The lateral motion in the engine truck and the driving wheels was within the limits prescribed by the carrier. The spring buffer arrangement between the engine and the tender was in good condition. At the outer edges of the buffer casting and block there were ridges of grease and dirt but the contact areas of the buffer and the chafing plate were dry. The drawbar between the engine and the tender was twisted clockwise.

Examination of the tender after the accident occurred disclosed no defective condition which might have contributed to the derailment. The bolster in the rear truck was broken, apparently as a result of the derailment, and the side bearing clearance could not be determined. The contact areas of all the side bearings indicated normal contact and wear. The male and female center plates of the front truck were in good condition and the bearing surfaces indicated normal contact and wear. The male and female center plates of the rear truck,

although showing normal contact and wear of the bearing surfaces, had the center pin holes elongated from 1/4 inch to 3/8 inch and indications of shearing of the metal at the edges of the rear quadrants. This condition indicated that the male center plate had been out of the female center plate and the rear edge of the male plate had been in contact with the top inner edge of the rim of the female plate. The absence of abnormal wear at the forward edge of the bearing surface of either plate, the lack of any indication at the column guides that the bolster was not riding approximately level, and the flow of metal downward at the back rim of the female plate indicate that the shearing occurred during the derailment. The elongation of the center-pin hole at the rear of the female plate and the forward edge of the male plate, together with the scraping and bending of the center pin, indicates that the tender was pushed off center at the rear truck as a result of the derailment while in backward motion. No defective condition was found in the splash-boards.

Examination of the track after the derailment occurred disclosed no indication of dragging equipment nor of an obstruction having been on the track. Throughout a considerable distance immediately south of the point of accident more than half of the spikes were not driven tight against the rail. The heads of some spikes projected as much as 2 inches above the base of the rail. At many of the rail joints one or more of the bolts were loose. The first mark of derailment was a flange mark on the west rail at a point 31 feet north of the wing rail of the frog. This flange mark extended diagonally across the head of the rail a distance of 13 feet 6 inches to the outer edges of the rail. The head of a spike 2 feet 6 inches northward and on the outside of the west rail was battered, and a companion flange mark appeared between the rails 6-1/2 inches from the gage side of the east rail. The next tie was flange-marked along the edge of the tie-plate outside the west rail but was not marked between the rails. The next northward tie was flange-marked 9 inches inside the gage side of the east rail but was not marked outside the west rail. Flange marks extended northward throughout a distance of 31 feet 8 inches to the point where the general derailment occurred.

The gage of the track in the vicinity of the point of accident varied from 4 feet 8-1/2 inches to 4 feet 9 inches. The specified curvature was 1°. However, eight points were checked in the 232.5 feet of track immediately south of the point of derailment, and at none of these points was the curvature 1°. The alignment varied from tangent to 2°30'.

The variations immediately south of the point of derailment were, in succession, 2°0' in 46.5 feet, 2°15' in 62 feet and 2°30' in 15.5 feet. In this same segment of track the surface of the outside rail varied from 1 inch high to 3/4 inch low, a total variation of 1-3/4 inches. Variations in track cross-levels immediately south of the point of derailment were, in succession, 1-1/4 inches in 26.5 feet, 1 inch in 4.5 feet, 5/8 inch in 28.5 feet, 1-3/8 inches in 33.5 feet and 1-1/2 inches in 10.5 feet.

The variations in the surface, alinement and gage of the track caused the tender of the locomotive to roll laterally to such an extent that the flange of the leading wheel on the west side was raised high enough to drop on top of the head of the west rail.

The track was inspected each week by a trackman, and it was inspected by the track foreman about 9 days before the accident occurred. They did not consider that any condition found required immediate repair.

Cause

It is found that this accident was caused by irregularities in the surface and alinement of the track.

Dated at Washington, D. C., this twenty-second day of May, 1951.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.