

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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REPORT NO. 3522  
THE BALTIMORE AND OHIO RAILROAD COMPANY  
IN RE ACCIDENT  
NEAR SMITHBURG, W. VA., ON  
APRIL 17, 1953

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SUMMARY

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Date: April 17, 1953  
Railroad: Baltimore and Ohio  
Location: Smithburg, W. Va.  
Kind of accident: Derailment  
Train involved: Passenger  
Train number: Passenger Extra 5049 West  
Engine number: 5049  
Consist: 10 cars  
Estimated speed: 35 m. p. h.  
Operation: Signal indications  
Track: Single; 6° curve; 0.47 percent descending grade westward  
Weather: Cloudy  
Time: 6:33 p. m.  
Casualties: 1 killed; 1 injured  
Cause: Overturning of a rail

INTERSTATE COMMERCE COMMISSION

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REPORT NO. 3522

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

THE BALTIMORE AND OHIO RAILROAD COMPANY

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July 9, 1953

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Accident near Smithburg, W. Va., on April 17, 1953, caused  
by the overturning of a rail.

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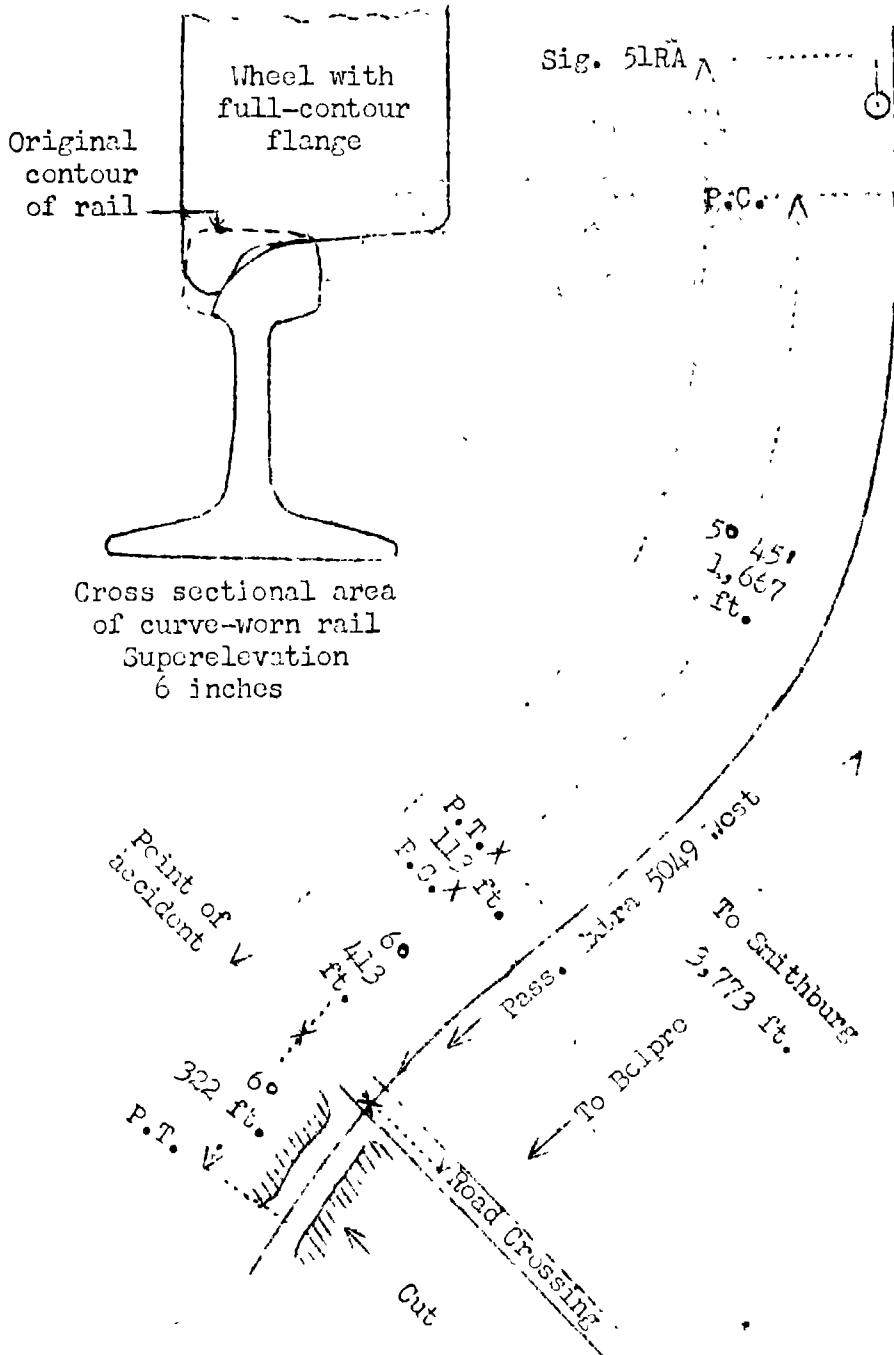
REPORT OF THE COMMISSION<sup>1</sup>

PATTERSON, Commissioner:

On April 17, 1953, there was a derailment of a passenger train on the Baltimore and Ohio Railroad near Smithburg, W. Va., which resulted in the death of one train-service employee and the injury of one train-service employee.

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<sup>1</sup>  
Under 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.



To East Grafton ↑

- East Grafton, W. Va. 2.2 mi.
- Grafton 46.8 mi.
- Smithburg, W. Va. 0.71 mi.
- X ( Point of accident ) 57.39 mi.
- Belpre, Ohio

Report No. 3522  
 Baltimore and Ohio Railroad Company  
 Smithburg, W. Va.  
 April 17, 1953

Location of Accident and Method of Operation

This accident occurred on that part of the Monongah Division extending between East Grafton, W. Va., and Belpre, Ohio, 107.1 miles. In the vicinity of the point of accident this is a single-track line, over which trains are operated by signal indications. The accident occurred on the main track at a point 49.71 miles west of East Grafton and 3,773 feet west of the station at Smithburg, W. Va. From the east there are, in succession, a 5°45' curve to the right, 1,667 feet in length, a tangent 113 feet, and a 6°00' curve to the left 413 feet to the point of accident and 322 feet westward. The grade for west-bound trains is, successively, 0.42 percent ascending 2,760 feet, and 0.47 percent descending 591 feet to the point of accident. In the vicinity of the point of accident the track is laid on a hillside with alternate cuts and fills. Immediately west of the initial point of derailment the track is laid in a through cut which extends westerly a short distance. West of this through cut the south wall of the cut rises to a height of about 10 feet and the embankment on the north side of the track slopes down about 25 feet to the bank of Middle Island Creek.

In the vicinity of the point of accident the track structure consists of 112-pound rail, 39 feet in length, laid new in 1941 on an average of 22 treated ties to the rail length. It is fully tieplated with double-shoulder canted tieplates, is single spiked with two additional hold-down spikes, and is provided with 6-hole 36-inch joint bars and an average of 9 rail anchors per rail. It is ballasted with crushed slag to a depth of 6 inches below the bottoms of the ties over a sub-base of crushed stone 18 inches in depth. The specified super-elevation of the curve is 6 inches. A full section of 112-pound rail is 6-5/8 inches high, and the head and the base are, respectively, 2-23/32 inches and 5-1/2 inches wide.

Signal 51RA, governing west-bound movements into the block in which the accident occurred, is located 2,438 feet east of the point of accident.

The maximum authorized speed for passenger trains is 45 miles per hour.

### Description of Accident

Passenger Extra 5049 West, a west-bound passenger train, consisted of engine 5049, a 4-6-2 type, one baggage car, four sleeping cars, one kitchen car and four sleeping cars, in the order named. All cars were of conventional all-steel construction. This train passed Smithburg at 6:31 p. m., as indicated on the traingraph of the traffic-control machine, passed signal 51RA, which indicated Proceed, and was moving at a speed of about 35 miles per hour when the engine and the first to the sixth cars, inclusive, and the front truck of the seventh car were derailed at a point 3,773 feet west of the station at Smithburg.

Separations occurred between the tender and the first car and between the first and the second cars. The engine stopped on its right side north of and at an angle of about 75 degrees to the track with the front end 531 feet west of the point of derailment and about 15 feet north of the track. The tender stopped on its right side at an angle of about 75 degrees with the engine and with the front end of the tender against the rear end of the engine. The first car stopped on its right side, parallel to and about 50 feet north of the track. The second car stopped upright behind the first car with the front end about 40 feet and the rear end about 15 feet north of the track. The third to the sixth cars, inclusive, and the front truck of the seventh car were derailed to the north. These cars stopped practically upright and in line. The second car was badly damaged, the first car and the third to the fifth cars, inclusive, were somewhat damaged and the sixth and the seventh cars were slightly damaged.

The total weight of engine 5049 in working order is 318,500 pounds, distributed as follows: Engine truck 55,000 pounds, driving wheels 201,000 pounds, and trailer truck 62,500 pounds. The specified diameters of the engine-truck wheels, driving wheels and trailer-truck wheels, are, respectively, 33 inches, 74 inches and 46 inches. The driving wheelbase is 13 feet long and the total wheelbase is 34 feet 8 inches long. The overall length of the engine and the tender, coupled, is 85 feet 4-5/16 inches. It is equipped with a speed-recording device and with No. 6 ET brake equipment.

The tender is rectangular in shape and is equipped with two 4-wheel trucks. Its capacity is 13,500 gallons of water and 21 tons of coal. The total weight is 236,000 pounds. The wheelbase is 30 feet 2 inches long and the overall length is 35 feet 4-3/4 inches.

The last classified repairs of engine 5049 were completed March 16, 1951, at Mt. Clare, Md. At the time of the accident the accumulated mileage was 87,273. The last trip inspection and repairs were completed at Grafton, 47.5 miles east of the point of accident, on April 16, 1953.

The engineer was killed, and the fireman was injured.

The weather was cloudy at the time of the accident, which occurred at 6:33 p. m.

#### Discussion

As Passenger Extra 5049 West was approaching the point where the accident occurred the engineer and the fireman were maintaining a lookout ahead from their respective positions in the cab of the engine. The members of the train crew were in various locations in the cars of the train. Signal 51RA, governing west-bound movements into the block in which the accident occurred, indicated Proceed, and the members of the crew on the engine called the indication. The fireman said the speed was about 35 miles per hour and that the engineer was working a light throttle. A running test of the brakes had been made after the train departed from Grafton and they had functioned properly when used en route. The fireman said that the rear driving wheels were derailed about 60 to 80 feet west of the first road crossing east of the point where the general derailment occurred. The engineer then made an emergency brake application. Apparently the engine-truck wheels remained on the track until the rear end of the engine moved over the embankment sufficiently to cause the engine to overturn. The members of the train crew said that the cars were riding smoothly when the brakes were applied in emergency. The tape of the speed-recording device was damaged to the extent that the speed at the time the derailment occurred could not be determined.

Examination of the engine after the accident occurred disclosed no defective condition which existed prior to the derailment. The driving-wheel assembly and the trailer-truck assembly were in good condition. The flanges and the treads

of all wheels of the engine were of full contour. All wheel centers were tight on their axles and all tires were tight on their wheel centers. The spring arrangement was maintained in good alignment and there was no indication of binding or fouling. Clearance between the pedestal caps and the bottoms of the driving-boxes were within the specifications of the carrier. The lateral motion of the No. 1 and No. 2 engine truck wheels was, respectively,  $7/16$  inch and  $5/8$  inch. The lateral motion of driving wheels Nos. 1 to 3, successively, was  $5/16$  inch,  $11/16$  inch and  $5/16$  inch. The lateral motion of the trailer-truck wheels was  $11/16$  inch. The driving-box shoes and wedges, and the chafing faces of the buffer between the engine and the tender were adequately lubricated. The flanges and the treads of all wheels of the tender were in good condition.

Examination of the track after the derailment occurred disclosed no indication of dragging equipment or of an obstruction having been on the track. There were some variations in the surface and gage. However, there were excessive variations in the alignment immediately east of the point of derailment. The high rail was excessively curve worn. On the gage side, the head was curve worn about  $5/8$  inch. The curve wear line sloped diagonally upward and outward at an angle of about  $13^\circ$  from the vertical a distance of about  $3/4$  inch and then rounded outward to the outside edge of the rail which was worn down about  $3/16$  inch. At the vertical axis the top of the head of the rail was worn about  $7/16$  inch. Approximately 45 percent of the cross-sectional area of the head of the rail was worn away. The track in the vicinity of the derailment was surfaced during the summer of 1950. It was checked for superelevation and gage on April 14, 1953. A rail-defect detector car was operated over this track on October 9, 1952, and no defective rails were found. The rail in this section had been mirror-checked on April 14, 1953.

The first marks of derailment were observed on the west end of a plank in a rail-highway grade crossing. This mark was a light flange mark about 4 inches inside the low rail. The high rail was canted outward beginning about 25 feet east of the flange mark on the crossing. From a point about 50 feet west of the crossing the high rail was overturned throughout a distance of about 170 feet. At that point the rail was broken and the track was destroyed throughout a distance of about 270 feet westward. Flange marks were found along the web of the overturned rail from the crossing westward. The rail was broken 20' 4- $1/2$ " from the receiving end. The rail was broken in several pieces, seven of which



were recovered. All breaks were new. Three were compression breaks in the bottom of the base of the rail. After the broken pieces of the rail were reassembled, in order, flange marks were observed on the web of the rail in straight lines across the breaks, showing that the rail was broken after the derailment occurred at the crossing.

Considering that the engine was in good condition, the flanges of the wheels were of full contour, and the outside rail was excessively curve worn, it is apparent that the flanges were in contact with the upper part of the inclined surface of the curve-worn area of the head of the rail. As a result it may be that the forces were directed sufficiently outward to cause the rail to become canted and, combined with wide gage, resulted in the outside rail being overturned.

Cause

It is found that this accident was caused by the overturning of a rail.

Dated at Washington, D. C., this ninth day of July, 1953.

By the Commission, Commissioner Patterson.

(SEAL)

GEORGE W. LAIRD,  
Acting Secretary.