

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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INVESTIGATION NO. 2721  
THE LOUISVILLE & NASHVILLE RAILROAD COMPANY  
REPORT IN RE ACCIDENT  
NEAR CLIFFSIDE, KY., ON  
AUGUST 15, 1943

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SUMMARY

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Railroad: Louisville & Nashville  
Date: August 15, 1943  
Location: Cliffside, Ky.  
Kind of accident: Derailment  
Train involved: Engine  
Train number: Extra 2405 North  
Engine number: 2405  
Estimated speed: 40 m. p. h.  
Operation: Timetable, train orders and  
automatic block-signal system  
Track: Single; 14<sup>o</sup> curve; 0.98 percent  
ascending grade northward  
Weather: Clear  
Time: About 10:47 a. m.  
Casualties: 1 killed; 2 injured  
Cause: Excessive speed on sharp curve

INTERSTATE COMMERCE COMMISSION

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INVESTIGATION NO. 2721

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

THE LOUISVILLE & NASHVILLE RAILROAD COMPANY

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September 8, 1943.

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Accident near Cliffside, Ky., on August 15, 1943, caused  
by excessive speed on a sharp curve.

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

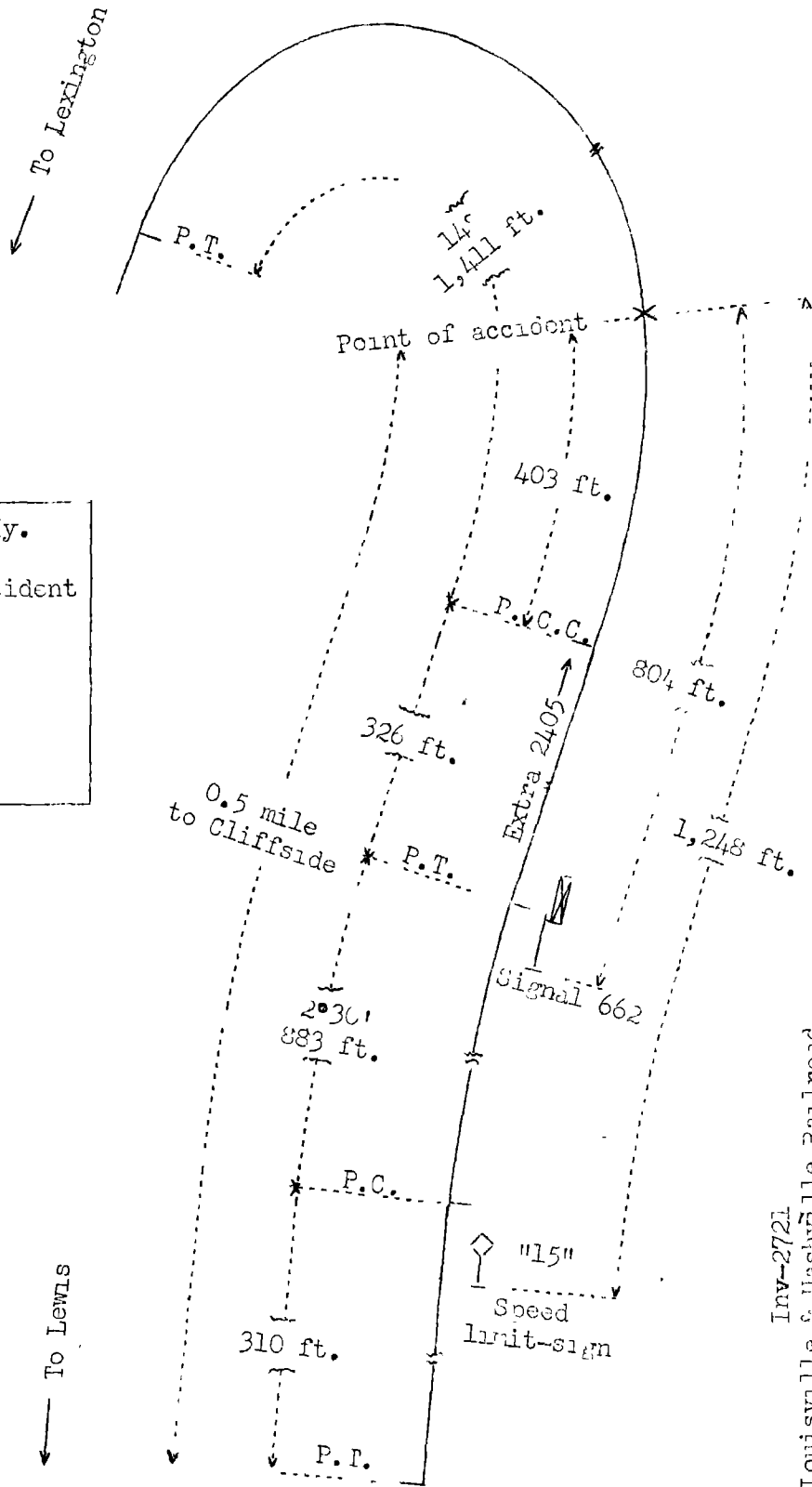
PATTERSON, Commissioner:

On August 15, 1943, there was a derailment of an engine on the Louisville & Nashville Railroad near Cliffside, Ky., which resulted in the death of one employee and the injury of two employees.

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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.

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|---|-------------------|----------|
| o | Lexington, Ky.    | 27.5 mi. |
| X | Point of accident | 0.5 mi.  |
| o | Cliffside         | 0.9 mile |
| o | Frankfort         | 15.8 mi. |
| o | Lewis, Ky.        |          |



Inv-2721  
 Louisville & Nashville Railroad  
 Cliffside, Ky.  
 August 15, 1943

Location of Accident and Method of Operation

This accident occurred on that part of the Eastern Kentucky Division extending between Lewis and Lexington, Ky., 44.7 miles. In the vicinity of the point of accident this was a single-track line over which trains were operated by timetable, train orders and an automatic block-signal system. The accident occurred 0.5 mile north of Cliffside. From the south there were, in succession, a tangent 310 feet in length, a  $2^{\circ}30'$  curve to the right 883 feet, a tangent 326 feet and a compound curve to the left 1,411 feet, the curvature of which varied between  $1^{\circ}15'$  and  $14^{\circ}45'$ . The derailment occurred on the latter-mentioned curve 403 feet north of its southern end, where the curvature was  $13^{\circ}52'30''$ . The grade for north-bound trains varied between 0.44 and 1.15 percent ascending 6,222 feet to the point of accident, and was 0.98 percent at that point.

On the curve involved the track was laid on a fill, the maximum height of which was 20 feet. The track structure consisted of 101.49-pound rail, 59 feet in length, on 22 treated ties to the rail length. It was fully tieplated, single-spiked, provided with 4 rail anchors and 5 gage rods per rail length, and was ballasted with crushed limestone to a depth of 13 inches. Throughout the curve 70-pound guard rails were located inside the low rail. The maximum superelevation on the curve was  $4\text{-}3/4$  inches and the gage varied between 4 feet  $8\text{-}1/2$  inches and 4 feet  $9\text{-}1/8$  inches. At the point of derailment the superelevation was  $3\text{-}3/4$  inches and the gage was 4 feet  $8\text{-}3/4$  inches.

Automatic signal 662, which governed north-bound movements, was located 804 feet south of the point of accident.

The maximum authorized speed on the curve involved was 15 miles per hour. A speed-limit sign bearing the numerals "15" was located 1,248 feet south of the south end of the curve.

Description of Accident

Extra 2405 North, consisting of engine 2405, of the 2-8-2 type, passed Frankfort, 0.0 mile south of Cliffside and the last open office, at 10:45 a. m., according to the dispatcher's record of movement of trains, passed Cliffside, passed signal 662, which displayed proceed, and was derailed while moving at a speed of about 40 miles per hour.

The engine was derailed to the outside of the curve and stopped on its right side down the embankment, with the front end 210 feet north of the point of derailment and 15 feet east of the track. The cab was demolished and the engine was otherwise badly damaged. The tender, remaining coupled to the engine, stopped on its right side at an angle of about 45 degrees to the engine, and was badly damaged.

It was clear at the time of the accident, which occurred about 10:47 a. m.

The engineer was killed, and the conductor and the fireman were injured.

After the accident an inspection of engine 2405 disclosed that the throttle valve was closed. Because of damage to the interior of the cab, the position of the reverse lever and the brake valves at the time of the accident could not be determined. There was no indication of defective condition of the engine prior to the accident.

The total weight of engine 2405 in working order was 306,700 pounds. The diameters of the engine-truck wheels, driving wheels and trailer-truck wheels were, respectively, 33, 60 and 42 inches. The tender was equipped with four-wheel trucks. The rigid wheelbase of the engine was 16 feet long, and the total length of the engine and tender was 78 feet 5-1/2 inches. The center of gravity was 66 inches above the top of the rails.

According to data furnished by the carrier, the maximum safe speed on a 14° curve having a superelevation of 3-3/4 inches and based on a 66-inch center of gravity was 32 miles per hour.

Measurements of 394 feet of track immediately south of the point of derailment were as follows:

<u>Distance south of point of derailment</u>	<u>Superelevation</u>	<u>Gage</u>		<u>Curvature</u>
<u>Feet</u>	<u>Inches</u>	<u>Feet</u>	<u>Inches</u>	<u>Degrees</u>
394	1-3/4	4	8-3/4	1°15'00"
355	2-1/2	4	8-5/8	2°45'00"
316	3-3/4	4	8-3/4	4°00'00"
277	4	4	8-1/2	5°30'00"
238	4-3/8	4	8-1/2	6°15'00"
199	4-3/4	4	8-5/8	8°45'00"
160	4-3/4	4	8-5/8	11°00'00"
121	4-3/4	4	8-1/2	12°00'00"
82	3-3/4	4	8-7/8	14°45'00"
43	3-1/2	4	8-1/2	13°45'00"
Point of derailment	3-3/4	4	8-3/4	13°52'30"

Discussion

Extra 2405 North was moving at a speed of about 40 miles per hour when it became derailed on a compound curve to the left, the maximum curvature of which was  $14^{\circ}45'$  and the maximum superelevation  $4-3/4$  inches. The maximum authorized speed on the curve was 15 miles per hour. The last automatic signal displayed proceed. Prior to the accident there was no defective condition of the engine and there was no indication of defective track or of any obstruction having been on the track.

The fireman said he and the conductor warned the engineer just before the engine entered the curve that the speed was excessive but the engineer did not take action to control the speed until just before the derailment occurred, then he closed the throttle and placed the brake valve in emergency position.

The first mark on the track structure was a flange mark on top of the head of the high rail 403 feet north of the south end of the curve. This mark extended diagonally from the inner corner to the outer corner and was 35 feet long. Extending from the north end of this mark a distance of 112 feet the ties bore wheel marks outside the high rail. From this point northward the shoulder of the fill was gouged to the point where the engine stopped. Measurements of the track throughout a distance of 394 feet immediately south of the point of derailment disclosed that the curvature varied from  $1^{\circ}15'$  to  $14^{\circ}45'$ . At stations 121 feet, 82 feet and 43 feet south of the point of derailment the curvature was, respectively,  $12^{\circ}$ ,  $14^{\circ}45'$  and  $13^{\circ}45'$ , and at the point of derailment it was  $13^{\circ}52'30''$ . Between stations 121 feet and 43 feet south of the point of derailment the surface varied  $1-1/4$  inches. These variations would cause the engine to pivot and to roll laterally. According to data furnished by the carrier, the maximum safe speed for engine 2405 on a  $14^{\circ}$  curve with a superelevation of  $3-3/4$  inches was about 32 miles per hour based on a center of gravity of 66 inches above the top of the rails. Evidently excessive speed increased the pivoting and the rolling of the engine to such an extent that the flange of a wheel on the right side of the engine mounted the high rail.

Cause

It is found that this accident was caused by excessive speed on a sharp curve.

Dated at Washington, D. C., this eighth day of September, 1943.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,  
Secretary.