

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 2698
THE TEXAS AND NEW ORLEANS RAILROAD COMPANY
SOUTHERN PACIFIC LINES
REPORT IN RE ACCIDENT
AT TUREKA, TEX., ON
MAY 9, 1943

SUMMARY

Railroad: Texas and New Orleans,
Southern Pacific Lines

Date: May 9, 1943

Location: Eureka, Tex.

Kind of accident: Derailment

Train involved: Passenger

Train number: 304

Engine number: 611

Consist: 13 cars

Estimated speed: 30-60 m. p. h.

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

Track: Double; 10° curve; 0.01 percent
ascending grade eastward

Weather: Partly cloudy

Time: About 3 a. m.

Casualties: 2 killed; 5 injured

Cause: Accident caused by excessive
speed on sharp curve

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2698

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

THE TEXAS AND NEW ORLEANS RAILROAD COMPANY
SOUTHERN PACIFIC LINES

June 22, 1945.

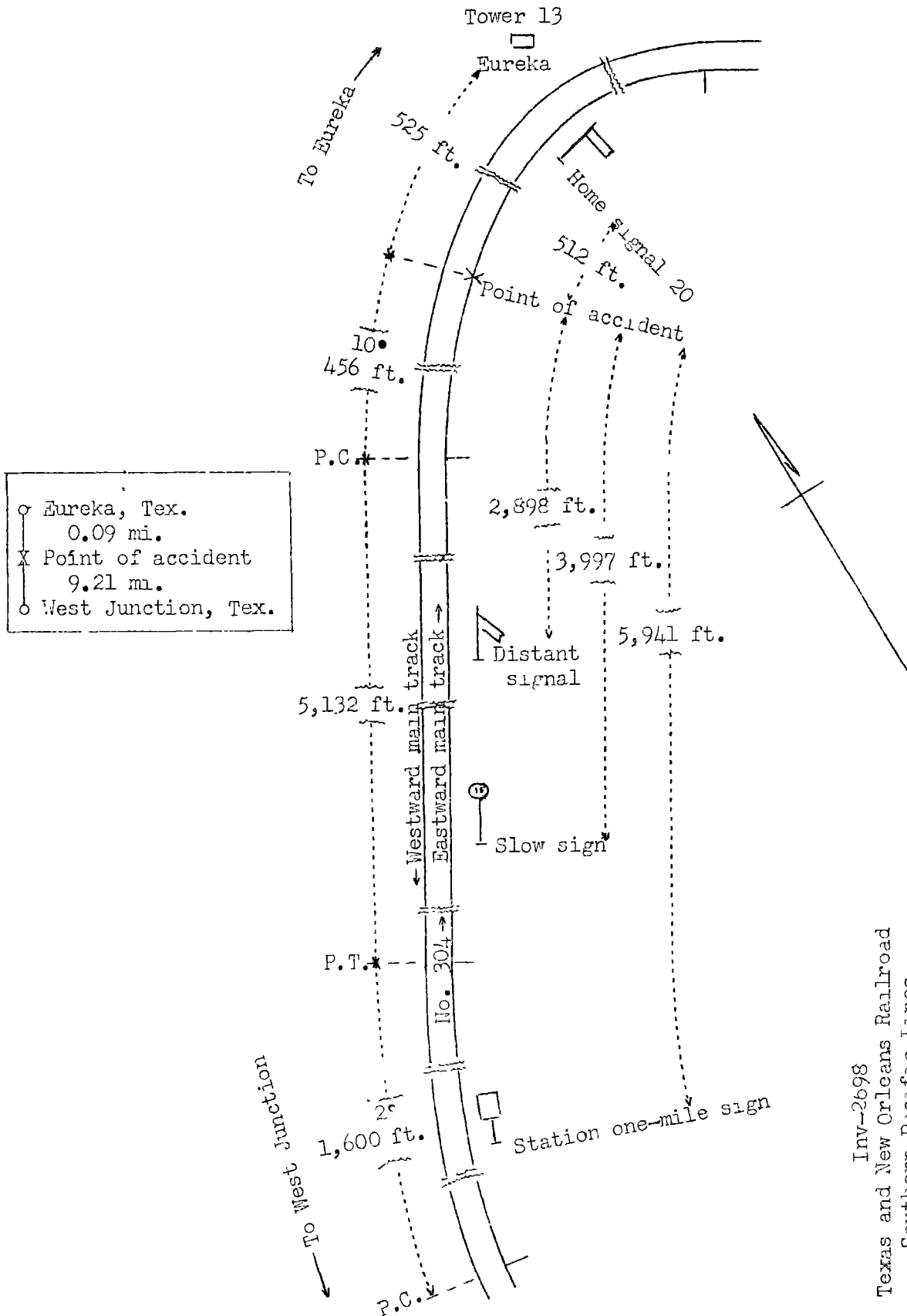
Accident at Eureka, Tex., on May 9, 1943, caused by excessive speed on sharp curve.

REPORT OF THE COMMISSION ¹

PATTERSON, Commissioner:

On May 9, 1943, there was a derailment of a passenger train on the Texas and New Orleans Railroad, of the Southern Pacific Lines, at Eureka, Tex., which resulted in the death of two train-service employees and the injury of four passengers and one railway-mail clerk.

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.



Inv-2698
 Texas and New Orleans Railroad
 Southern Pacific Lines
 Eureka, Tex.
 May 9, 1913

Location of Accident and Method of Operation

This accident occurred on that part of the Houston Division extending between West Junction and Eureka, Tex., 9.3 miles. In the immediate vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred on the eastward main track at a point 525 feet west of the tower at Eureka. Approaching from the west there are, in succession, a 2^o curve to the right 1,600 feet in length, a tangent 5,132 feet, and a compound curve to the right 1,468 feet in length. The accident occurred on the latter-mentioned curve 456 feet east of its western end where the curvature is 10 degrees. The grade for east-bound trains varies between 0.01 and 0.33 percent ascending 4,200 feet to the point of accident, and is 0.01 percent at that point.

On the curve involved the track structure consists of 112-pound rail on the high side and 110-pound rail on the low side, 39 feet in length, laid on 21 treated ties to the rail length; it is fully tieplated, double-spiked, provided with 6 rail anchors per rail length, except one rail length about 250 feet west of the point of accident, and is ballasted with gravel to a depth of 8 inches. The super-elevation varied between 1-9/16 inches and 3-7/32 inches and the gage varied between 4 feet 8-1/2 inches and 4 feet 9 inches. At the point of accident the super-elevation was 2-1/2 inches and the gage 4 feet 8-1/2 inches.

The maximum authorized speed on the curve involved is 15 miles per hour. A speed-limit sign bearing the numerals "15" is located 3,997 feet west of the west end of the curve and 11 feet south of the center-line of the track. On tangent track the maximum authorized speed is 60 miles per hour.

Description of Accident

After a terminal air-brake test was made, No. 304, an east-bound first-class passenger train, departed from Corpus Christi, 235.2 miles west of Eureka, at 11:50 p. m., May 8, according to the dispatcher's record of movement of trains, on time. This train, consisting of engine 611, of the 4-6-2 type, two refrigerator cars, one baggage-mail car, two baggage cars, one refrigerator car, one Pullman sleeping car, one chair car, two coaches, one Pullman sleeping car and two Pullman tourist cars, in the order named, departed from Skidmore, 190.5 miles west of Eureka, at 2:40 a. m., May 9, 50 minutes late, passed West Junction, 9.3 miles west of

Eureka and the last open office, at 7:50 a. m., 46 minutes late, and while moving at a speed variously estimated as 30 to 60 miles per hour the engine and first four cars were derailed on a 10° curve to the right. Cars had been set off and others added at points en route, and the brakes had controlled the speed properly.

Engine 611 was derailed to the north and stopped on its left side across the westward main track at an angle of 25 degrees, with its front end 253 feet east of the point of accident. The front-end frame was broken, and the cab was demolished. The tender stopped, badly damaged, at right angles to the engine, with its front end against the rear of the engine, and its rear end 54 feet north of the eastward main track. The first car stopped upright across the westward main track and against the engine and tender. This car was destroyed. The second car stopped on its right side south of the eastward main track, with its front end 351 feet east of the point of accident, and was destroyed. The third and fourth cars remained coupled and stopped upright, badly damaged, on the roadbed of the eastward main track and practically in line with it, and with the front end of the third car 311 feet east of the point of derailment.

It was partly cloudy at the time of the accident, which occurred about 8 a. m.

The train-service employees killed were the engineer and the fireman.

After the accident an inspection of engine 611 disclosed that the throttle was three-fourths open, the reverse lever was in position for 25 percent cut-off in forward motion, and the independent and the automatic brake valves were in running position. All flanges were of good contour and the height and thickness were within the prescribed limits. The maximum tread wear was 7/64 inch. The lateral motion of all wheels and the back-to-back measurements of the driving-wheel tires, the engine-truck wheels and the trailer-truck wheels conformed to prescribed requirements. The spring rigging was in suitable condition for service. The tender-truck wheels conformed to prescribed requirements. After the accident, tests disclosed that the air-brake equipment of engine 611 functioned as intended. All angle cocks were in proper position and the brake-pipe hose were free of obstructions.

The total weight of engine 611 in working order is 291,200 pounds. The diameters of the engine-truck wheels, driving wheels and trailer-truck wheels are, respectively, 33 inches, 77-1/2 inches and 45-1/2 inches. The tender is cylindrical in shape and is equipped with two four-wheel trucks. The rigid wheelbase of the engine is 13 feet 4 inches long, and the total

length of the engine and tender is 84 feet 10-5/16 inches. The center of gravity is 74-1/8 inches above the top of the rails. Engine 611 is provided with derailment safety-guards, which are 1 inch thick and 21 inches long, bolted to the pedestals of the engine-truck and the trailer truck. These are designed to prevent derailed equipment from leaving the track structure.

After the accident, measurements of the track taken throughout a distance of 600 feet west of the point of accident were as follows:

<u>Distance west of point of accident</u>	<u>Superelevation</u>	<u>Gage</u>
<u>Feet</u>	<u>Inches</u>	<u>Feet Inches</u>
600	0	4 8-3/8
575	1/8	4 8-1/2
550	11/32	4 8-3/8
525	3/4	4 8-3/8
500	1-3/16	4 8-1/2
475	2-5/32	4 8-1/2
450	2-9/32	4 8-1/2
425	2-3/4	4 8-1/2
400	3-7/32	4 8-5/8
375	3-1/8	4 8-1/2
350	2-3/4	4 8-5/8
325	2-5/32	4 8-5/8
300	1-9/16	4 8-3/4
275	1-29/32	4 8-3/4
250	1-13/16	4 8-3/4
225	2-5/32	4 9
200	2-9/32	4 9
175	2-5/8	4 8-5/8
150	2-3/4	4 8-1/2
125	2-5/8	4 8-1/2
100	2-3/4	4 8-1/2
75	2-3/4	4 8-1/2
50	2-3/4	4 8-1/2
25	2-3/4	4 8-3/4
Point of accident	2-1/2	4 8-1/2

According to data furnished by the carrier, the equilibrium, comfortable, safe and overturning speeds on a 10° curve having a superelevation of 2-3/4 inches and based on an 84-inch center of gravity, are, respectively, 20, 29, 35.5 and 56 miles per hour.

Discussion

No. 304 was moving on a 10° curve to the right, having a maximum superelevation of $3\text{-}7/32$ inches, when the engine and the first four cars were derailed at a point where the superelevation was $2\text{-}1/2$ inches. The engine overturned to the left and stopped 253 feet beyond the point of derailment. The maximum authorized speed on the curve was 15 miles per hour. There was no defective condition of the engine prior to the accident, and there was no indication of dragging equipment, defective track, or of any obstruction having been on the track. There was no obstruction in the flangeways of a highway grade crossing located 88 feet west of the point of derailment.

The conductor, the front brakeman, the flagman, and several members of a deadheading crew on No. 304 estimated the speed to be about 35 miles per hour at the time of the accident; however, one member of the deadheading crew estimated the speed to be about 45 miles per hour. An operator located in a tower about 525 feet east of the point of derailment estimated the speed to be about 60 miles per hour at the time of the derailment, and said the engine was exhausting heavily. No employee on the train felt the application of the brakes prior to the derailment. After the accident, examination disclosed that the throttle was three-fourths open and both brake valves were in running position. Several employees heard the engine whistle sounded for a highway grade crossing a short distance west of the curve involved. The engineer and the fireman were both familiar with the territory involved. Since both were killed in the accident, it could not be determined why action was not taken to control the speed of No. 304 properly in accordance with the speed restriction on the curve. The brakes of No. 304 had functioned properly en route.

After the accident, examination of the track disclosed that the first mark on the track structure was a tread mark on the outside edge of the head of the high rail. This mark started at a point 401 feet east of the west end of the curve and extended eastward a distance of about 50 feet. At a point 456 feet east of the west end of the curve there were flange marks about 8 inches outside the high rail on the tops of three ties, and the ends of the ties were marked throughout a distance of about 40 feet farther east; however, at the point where flange marks appeared on the tops of the three ties there were marks in the ballast. The division engineer thought these marks indicated that the engine was overturned at that point and continued in a tangential direction until

it encountered the westward main track, then the engine was diverted in line with that track throughout a distance of about 210 feet. He thought the marks on the ends of the ties were made by some unit of derailed equipment other than the engine. There was no flange mark on the tops of ties between the high and the low rails. There was no mark on any derailment safety-guard to indicate it had been in contact with a rail. The operator said there was no indication of dust or dirt being thrown upward before the engine overturned. According to A.R.E.A. tables and data submitted by the carrier, the overturning speed based on an 84-inch center of gravity on the curve involved was 56 miles per hour, and the maximum safe speed, 55.5 miles per hour. The investigation disclosed that the greatest variation in gage was 1/4 inch. Between points 325 and 300 feet west of the point of derailment, the surface varied 19/32 inch; however, the greatest variation of surface at other stations 25 feet apart was 11/32 inch. These variations would cause the engine to roll laterally to some extent. The enginemen of No. 8, which passed around the curve involved about 6 a. m., said their engine rode smoothly at a speed of 15 miles per hour, and the track was in good condition. Since the engine overturned to the outside of the curve without marking the ties between the rails or outside the high rail, and without making a flange mark on the head of the outside rail, it is evident that the engine was moving at a rate of speed sufficient to cause it to overturn to the high side of the curve. Apparently the estimates given by employees on No. 504 were lower than the actual speed.

Cause

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

Dated at Washington, D. C., this twenty-second day of June, 1945.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.