

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3035
THE TEXAS AND PACIFIC RAILWAY COMPANY
REPORT IN RE ACCIDENT
NEAR PAYNE, TEX., ON
NOVEMBER 6, 1946

SUMMARY

Railroad: Texas and Pacific
Date: November 6, 1946
Location: Payne, Tex.
Kind of accident: Derailment
Train involved: Freight
Train number: Extra 661 West
Engine number: 661
Consist: 55 cars, caboose
Speed: 47 m. p. h.
Operation: Signal indications
Track: Single; 3°26' curve; 1.05 percent
descending grade westward
Weather: Clear
Time: 11:17 p. m.
Casualties: 1 killed; 2 injured
Cause: Probably broken rail

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3035

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

THE TEXAS AND PACIFIC RAILWAY COMPANY

January 27, 1947

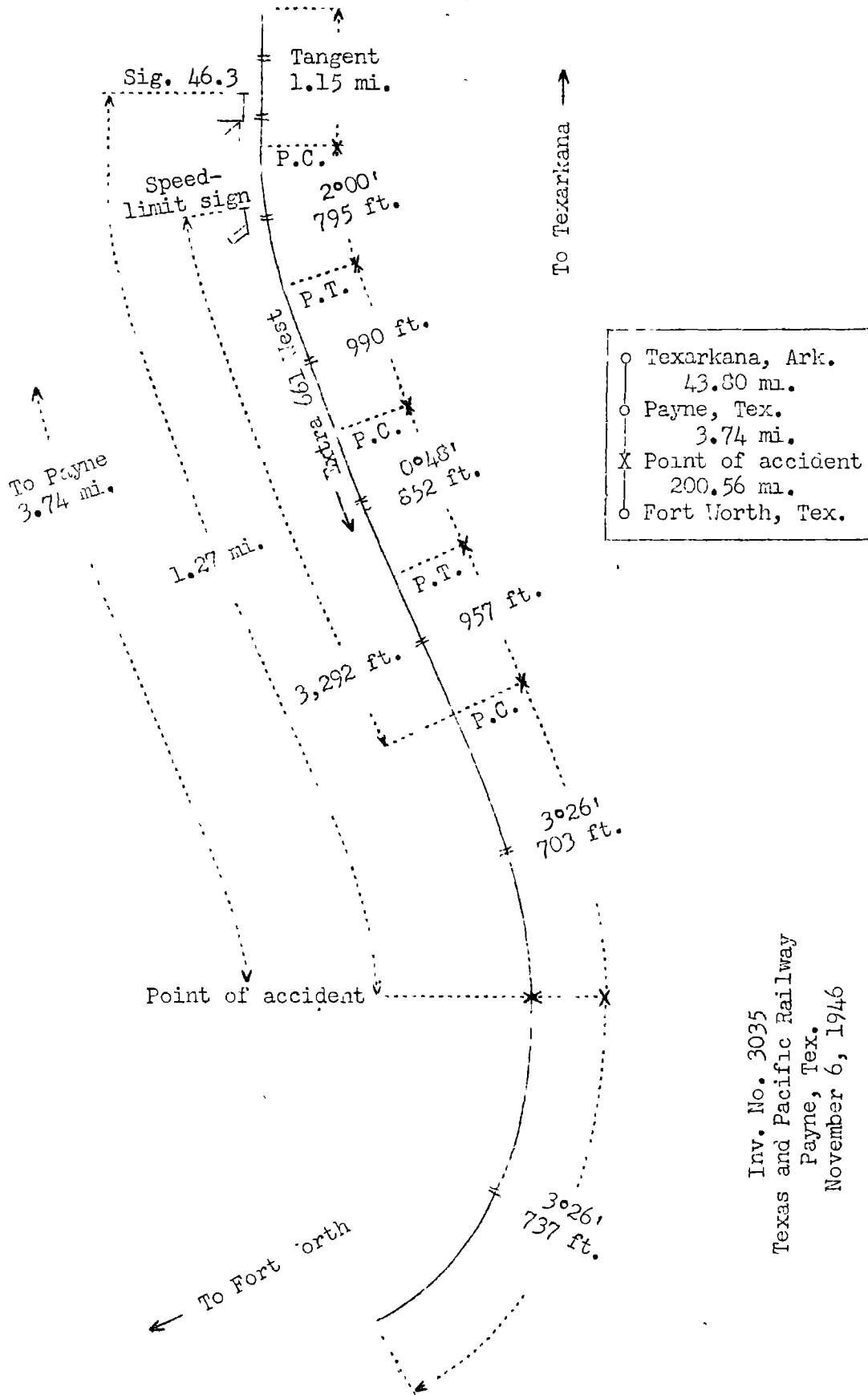
Accident near Payne, Tex., on November 6, 1946, probably
caused by a broken rail.

REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On November 6, 1946, there was a derailment of a freight train on the Texas and Pacific Railway near Payne, Tex., which resulted in the death of one train-service employee, and the injury of one employee off duty and one train-service 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.



Inv. No. 3035
 Texas and Pacific Railway
 Payne, Tex.
 November 6, 1946

Location of Accident and Method of Operation

This accident occurred on that part of the Eastern Division extending between Texarkana, Ark., and Fort Worth, Tex., 248.1 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 47.54 miles west of Texarkana and 3.74 miles west of the station at Payne. From the east there are, in succession, a tangent 1.15 miles in length, a 2°00' curve to the left 795 feet, a tangent 990 feet, a 0°48' curve to the left 852 feet, a tangent 957 feet and a 3°26' curve to the right 703 feet to the point of accident and 737 feet westward. The grade for west-bound trains varies between 0.50 percent and 1.10 percent ascending 2,200 feet, then it varies between 0.30 percent and 1.05 percent descending 436 feet to the point of accident, where it is 1.05 percent. In the immediate vicinity of the point of accident the track is laid in a cut, the walls of which rise to a height of about 20 feet above the level of the top of the rails.

On the curve on which the accident occurred, the track structure consists of 112-pound rail, 39 feet in length, laid new in January, 1936, on an average of 23 treated ties to the rail length. It is fully tieplated with double-shoulder canted tieplates, double-spiked, provided with 4-hole head-free angle bars and an average of 8 rail anchors per rail length, and is ballasted with washed gravel to a depth of about 12 inches. The specified superelevation on the curve was 5-1/2 inches, and the gage varied between 4 feet 8-1/2 inches and 4 feet 8-3/4 inches.

Automatic signal 46.3 governing west-bound movements, is 1.27 miles east of the point of accident.

The maximum authorized speed for the train involved was 60 miles per hour in the territory immediately east of the point of accident and 50 miles per hour on the curve on which the derailment occurred. A speed-limit sign, bearing the numerals 50 in black on a white background, is located about 7 feet north of the north rail of the main track and 3,292 feet east of the east end of the curve.

Description of Accident

Extra 661 West, a west-bound freight train, consisting of engine 661, a 2-10-4 type, 55 cars and a caboose, passed Payne at 11:13 p. m., and while moving at a speed of 47 miles per hour the engine and the first 33 cars were derailed.

The engine and the tender, remaining coupled, stopped on their left sides about 10 feet south of the track and practically parallel to it, with the front of the engine 145 feet west of the point of derailment. The derailed cars stopped in various positions across the track and between the walls of the cut. The derailed equipment was considerably damaged.

The weather was clear at the time of the accident, which occurred about 11:17 p. m.

The fireman was killed, and the engineer was injured.

Engine 661 is equipped with a booster engine mounted on the trailer-truck, which is of the articulated 4-wheel type. The total weight of the engine in working order is 457,500 pounds, distributed as follows: Engine truck, 43,500 pounds; driving wheels, 307,000 pounds; and trailer-truck, 107,000 pounds. The specified diameters of the engine-truck wheels, the driving wheels, and the front and rear trailer-truck wheels are, respectively, 33, 63, 36 and 43 inches. The driving wheelbase is 22 feet long, the total length of the engine wheelbase is 46 feet 8 inches, and the total length of the engine and tender is 99 feet 1 inch. The engine-truck is equipped with rocker-type constant-resistance devices, and the No. 1 pair of driving wheels is equipped with a wedge-type lateral-motion device. The Nos. 3 and 4 pairs of driving wheels are cross-counterbalanced. The trailer truck is equipped with geared-resistance-rollers. The tender is rectangular in shape, and is equipped with two 6-wheel trucks. Its capacity is 5,000 gallons of fuel oil and 14,000 gallons of water. The weight of the tender loaded is 281,666 pounds. The center of gravity of the engine is 73 inches above the top of the rails, and the center of gravity of the tender, with the calculated amount of fuel and water at the time of the accident, was 69 inches above the top of the rails. The last Class 3 repairs were completed on May 8, 1945, and the last monthly inspection and repairs were completed on November 4, 1946. The accumulated mileage since the last class repairs was 96,435 miles. The theoretical equilibrium speed, safe speed and overturning speed for engine 661 on the curve involved was, respectively, 50, 61.2 and 105 miles per hour.

Discussion

Extra 661 West was moving on a 3°26' curve to the right at a speed of 47 miles per hour, as indicated by the tape of the speed recorder with which the engine was equipped, in territory where the maximum authorized speed was 50 miles per hour, when the engine and the first 33 cars were derailed.

As Extra 661 West was approaching the point where the accident occurred, the headlight was lighted brightly, and the enginemen were maintaining a lookout ahead. The front brakeman and an employee of the mechanical department were in the brakeman's booth on the tender. The conductor and the flagman were in the caboose. Signal 46.3, located 1.27 miles east of the point where the derailment occurred, displayed proceed, and the enginemen called the indication. The engine was riding smoothly, and there was no unusual slack action. The first the engineer knew of anything being wrong was when he felt a sudden downward movement of the rear portion of the engine. He immediately moved the brake valve to emergency position and closed the throttle lever, then the engine overturned to the left. The fireman was killed. The brakes of this train had been tested and had functioned properly en route.

Beginning at the east end of the curve the superelevation increased 1/2 inch in each 32 feet throughout a distance of 352 feet to the point of full curvature, and the curvature increased about $0^{\circ}23'$ to each 44-foot chord of the spiral. The specified curvature at the point of accident was $3^{\circ}26'$, the specified superelevation was 5-1/2 inches and the specified gage was 4 feet 8-1/2 inches. As a result of the derailment, the track was destroyed throughout a distance of 360 feet between points 382 feet and 742 feet west of the east end of the curve. Examination of the track throughout a considerable distance eastward from the east end of the disturbed track disclosed that the surface, alinement and gage were well maintained for normal service. There was no mark on the track structure indicating dragging equipment. The track on the curve was last resurfaced 5 days prior to the day the accident occurred. It was last inspected by the section foreman during the afternoon of the day of the accident, and no unusual condition was observed. An east-bound passenger train passed over this track at a speed of about 50 miles per hour about 1 hour before the derailment occurred, and there was no indication of defective track. The derailment occurred in a cut, the walls of which rise to a height of about 20 feet above the level of the top of the rails. During a rainy period of several days immediately prior to the accident, water had softened the walls of the cut and the drainage ditches on each side of the track. However, the ditches were unobstructed and provided adequate drainage. The displaced track structure was forced from the roadbed into the ditches, and no tie or rail was left in place throughout a distance of 360 feet. Practically all the ballast in this area was displaced. The railholding spikes were either pulled or sheared from the ties. A number of rails and angle bars were broken, and some of the rails were broken into numerous pieces. Not all of the broken pieces were recovered. Examination of the broken rails which

were recovered indicated that the fractures were new, and no defect was found which might have caused the initial fracture.

Examination of the engine disclosed that the engine-truck and the driving-wheel assemblies were in good condition. The tires, the wheels and the lateral motion were within the specified limits. The driving-box shoes, wedges, lateral device and radial buffer castings were well lubricated and moved freely. The spring arrangements were maintained in good alignment, the equalizers were properly maintained, and there was no indication of unequal distribution of weight. The trailer-truck was intact and in normal condition. There was no mark of derailment on the treads, flanges or sides of the engine-truck wheels. The outside face of the driving-wheel tires, counterbalances and rods on the right side of the engine bore scraping and batter marks which indicated that these wheels had been derailed inside the low rail before the engine overturned. There was no mark on the left wheels. Several marks appeared on the engine-truck radial-bar brackets as a result of contact with overturned rails just before the engine overturned. The engine is cross-counterbalanced, and the dynamic augment at 60 miles per hour is less than 50 percent of the static weight on the driving wheels. At the time of the accident, the speed was about 3 miles per hour below equilibrium speed for the curve involved.

Considering the action of the engine immediately before it overturned, together with the marks on the right side of the driving-wheel assembly of the engine and the absence of marks on the engine-truck wheels, it is likely a rail on the left or high side of the curve broke when the engine-truck wheel passed over it and immediately became displaced under the front driving wheel, then the wheels on the right side dropped inside the low rail and the general derailment followed.

Cause

It is found that this accident was probably caused by a broken rail.

Dated at Washington, D. C., this twenty-seventh day of January, 1947.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.