INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 3140

THE TEXAS AND PACIFIC RAILWAY COMPANY

REPORT IN RE ACCIDENT

AT JEFFERSON, TEX., ON

OCTOBER 25, 1947

SUMMARY

Railroad:	Texas and Pacific
Date:	October 25, 1947
Location:	Jefferson, Tex.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	First 15
Engine number:	907
Consist:	7 cars
Speed:	72 m. p. h.
Operation:	Signal indications
Track:	Single; 7° curve; 0.25 percent ascending grade westward
Weather:	Dense fog
Time:	3:15 a. m.
Casualties:	1 killed; 70 injured
Cause:	Excessive speed on curve

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3140

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

THE TEXAS AND PACIFIC RAILWAY COMPANY

December 10, 1947

Accident at Jefferson, Tex., on October 25, 1947, caused by excessive speed on a curve.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On October 25, 1947, there was a derailment of a passenger train on the Texas and Pacific Railway at Jefferson, Tex., which resulted in the death of 1 train-service employee, and the injury of 62 passengers, 4 railway-mail clerks, 1 express messenger, 1 train porter and 2 train-service employees.

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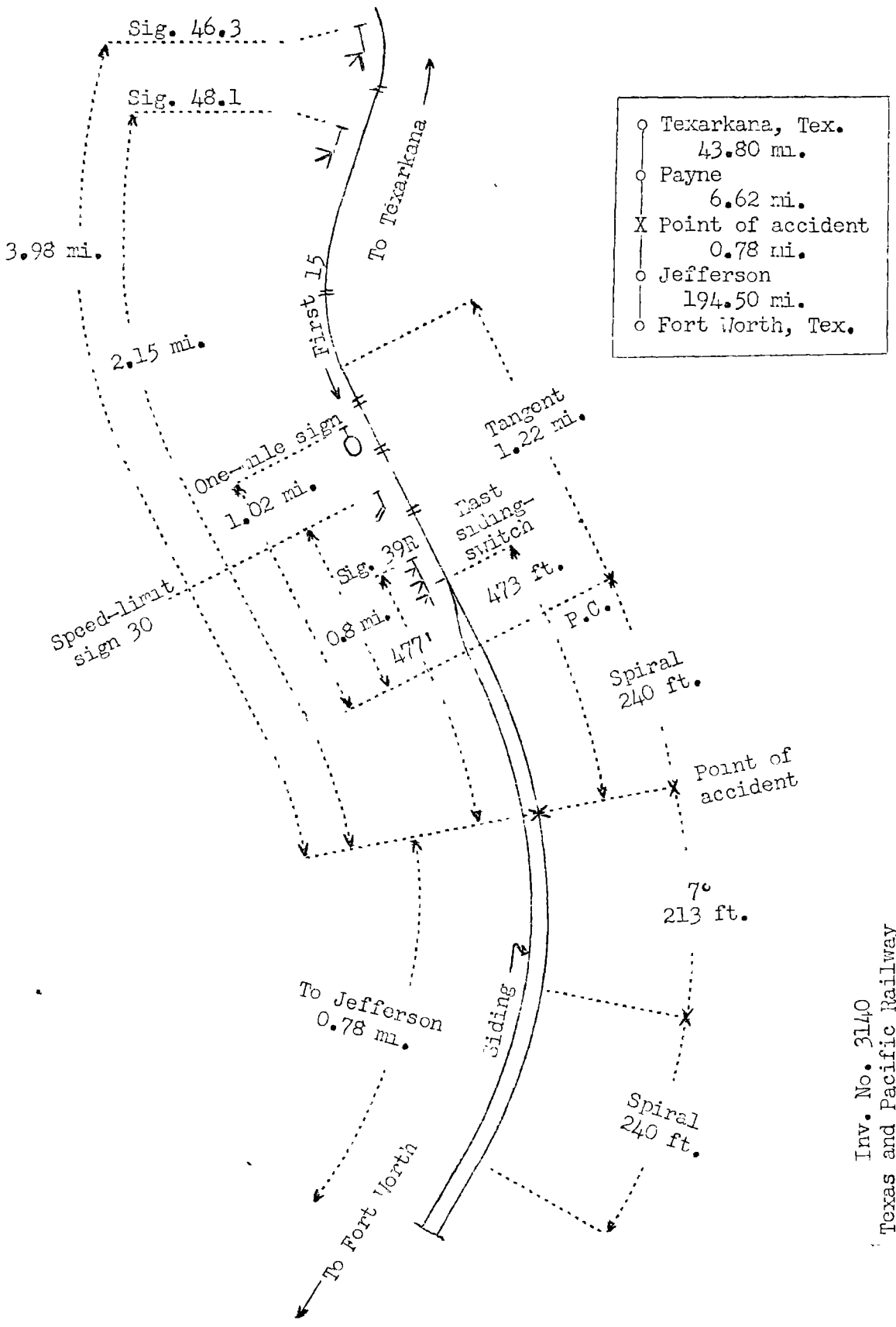
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 3140
Texas and Pacific Railway
Jefferson, Tex.
October 25, 1947

Location of Accident and Method of Operation

This accident occurred on that part of the Eastern Division extending between Texarkana and Fort Worth, Tex., 245.7 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 50.42 miles west of Texarkana, at a point 0.78 mile east of the station and 473 feet west of the east siding-switch at Jefferson. From the east there are, in succession, a tangent 1.22 miles in length, a spiral curve to the right 240 feet, a 7° curve to the right 213 feet and a spiral curve to the right 240 feet. The derailment occurred at the juncture of the east spiral and the full curvature. The grade for west-bound trains varies between 0.30 and 1.15 percent ascending 2,500 feet, is level 200 feet, varies between 0.20 and 1.35 percent descending 2,400 feet, then it is 0.25 percent ascending 159 feet to the point of accident and 841 feet westward.

On the curve on which the accident occurred the track is laid on an 8-foot fill, and consists of 112-pound rail, 39 feet in length, rolled in April, 1943, and laid during May, 1943, on 22 treated ties to the rail length. It is fully tieplated with double-shoulder canted tie plates, spiked with 3 spikes per tie plate, and provided with 4-hole head-free joint bars 24 inches in length, and 10 rail anchors per rail length. It is ballasted with gravel to a depth of about 18 inches below the ties. The specified superelevation on the 7° curvature was 4-1/2 inches. At the point of derailment the superelevation was 4-5/8 inches, the gage was 4 feet 8-5/8 inches and the curvature was 7°.

Automatic signals 46.3 and 48.1 and semi-automatic signal 39R, governing west-bound movements, are, respectively, 3.98 miles, 2.15 miles, and 477 feet east of the point of accident. These signals are of the color-light type, and are approach lighted.

This carrier's operating rules read in part as follows:

DEFINITIONS

* * *

Fixed Signal.--A signal of fixed location indicating a condition affecting the movement of a train or engine.

* * *

10 (g). * * * The maximum speed of trains on track protected by permanent slow signals will be shown on the face thereof; * * *

910. During foggy or stormy weather take extraordinary precautions, both at switches and at all places where authority to proceed depends upon signals.

The maximum authorized speed for the train involved is 70 miles per hour on tangent track. The maximum authorized speed for all trains on the curve on which the accident occurred is 30 miles per hour. A point-of-switch-one-mile sign and a speed-limit sign are located on the north side of the track at points, respectively, 1.02 miles and 0.80 mile east of the east end of the curve. The speed-limit sign is 0.5 feet wide and 2.75 feet long and is mounted diagonally on a mast 8 feet 4.5 inches above the level of the tops of the rails, and bears the numerals "30" in black on a white background.

Description of Accident

First 15, a west-bound first-class passenger train, consisted of engine 907, a 4-8-2 type, one mail car, one baggage car, two coaches and three sleeping cars, in the order named. All cars were of steel construction. This train departed from Payne, 7.4 miles east of Jefferson, at 3:08 a. m., 13 minutes late, passed signals 46.3 and 48.1, which displayed proceed, passed the speed-limit sign, passed signal 39R, which displayed proceed, and while it was moving at a speed of about 72 miles per hour the engine, the tender and the first six cars were derailed.

The engine overturned to the left, continued in a tangential line and stopped on its left side down the embankment, with the front end 385 feet west of the point of derailment and 32 feet south of the centerline of the main track. The engine truck was torn loose, and stopped 32 feet west of the engine. Breaks in the safety chains of the engine-truck assembly were new. The left side of the engine was badly damaged, and the cab was torn loose. The tender remained coupled to the engine and stopped on its left side at the rear of the engine, with the rear end 50 feet south of the track. Both trucks were torn loose, and the frames were broken. Separations occurred at each

end of the first to fifth cars, inclusive. The cars were not equipped with tightlock couplers. The first car stopped upright, between the engine and the main track, about 16 feet south of the track and parallel to it, with the front end 32 feet west of the engine. The second car stopped on its left side, in reverse direction and at an angle of 70 degrees to the track, with the roof at the front end against the rear of the tender and the rear end 19 feet south of the track. Both trucks were broken. The third car stopped upright, in reverse direction, and parallel to the second car, with its rear end 20 feet south of the track. The fourth car stopped on its right side, in reverse direction, against the third car and parallel to it, with its rear end on the roadbed. The fifth car stopped at an angle of 45 degrees to the track, with its front end 39 feet south of the track and against the fourth car, and the rear end 7 feet south of the track. The sixth car stopped upright, at the rear of the fifth car and in line with it, with the front end 4 feet south of the track and the rear end on the roadbed. The first six cars were considerably damaged.

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

A dense fog prevailed at the time of the accident, which occurred at 3:15 a. m.

Engine 907 is equipped with a booster engine mounted on the trailer truck. The total weight of the engine in working order is 361,400 pounds, distributed as follows: Engine truck, 60,800 pounds; driving wheels, 245,600 pounds; and trailer truck, 55,000 pounds. The specified diameters of the engine-truck wheels, the driving wheels, and the trailer-truck wheels are, respectively, 36, 73 and 51 inches. The driving wheelbase is 20 feet long, the total length of the engine wheelbase is 43 feet 3 inches, and the total length of the engine and tender is 96 feet 1-1/2 inches. The No. 1 pair of driving-wheel journal boxes is equipped with a lateral-motion device. The Nos. 2 and 3 pairs of driving wheels are cross counterbalanced. The engine truck and the trailer truck are equipped with rocker-type constant-resistance devices. The engine is equipped with a speed-recorder.

The tender is rectangular in shape, and is equipped with two 6-wheel trucks. Its capacity is 6,000 gallons of fuel oil and 14,000 gallons of water. The weight of the tender loaded is 291,666 pounds.

The last class 3 repairs were completed on February 24, 1944. The last class 5 and annual inspection and repairs were completed May 10, 1947. The last trip inspection and repairs were completed at Texarkana on October 24, 1947. The accumulated mileage since the last class 3 repairs was 386,768 miles.

The center of gravity of the engine is 77 inches above the tops of the rails. The center of gravity of the tender, with the calculated amount of fuel and water remaining at the time of the accident, was estimated as 72 inches above the tops of the rails. The calculated equilibrium, safe and overturning speeds for engine 907 moving on a 7° curve having a superelevation of 4-1/2 inches are, respectively, 31.4, 40.3 and 73.5 miles per hour.

Discussion

First 15 was moving on the receiving spiral of a 7° curve to the right at a speed of about 72 miles per hour when it was derailed. The maximum authorized speed for this train was 70 miles per hour on tangent track and 30 miles per hour on the curve.

As First 15 was approaching the curve, the headlight was lighted brightly, the throttle was half open and the enginemen were maintaining a lookout ahead. The baggageman was in the second car, the conductor and the train porter were in the third car, and the flagman was in the rear car. The engine and the cars had been riding in a normal manner prior to the accident. Fog prevailed throughout the territory between Texarkana and Jefferson. The engineer said that soon after First 15 passed signal 46.3, located 3.98 miles east of the point of accident, he became confused as to his location, because dense fog restricted visibility. He did not see signal 48.1, the point-of-switch-one-mile sign, or the 30-mile per hour speed-limit sign, located, respectively, 2.1 miles, 1.02 miles and 0.8 mile east of the curve involved. When his engine reached a point about 600 feet east of the curve the fog was less dense, and he saw the proceed indication displayed by signal 39R, located 236 feet east of the east end of the curve. Realizing that he was closely approaching the curve, he immediately closed the throttle and placed the brake valve in emergency position. He thought the speed was reduced to about 55 miles per hour when the engine entered the curve. The engine thrust hard several times, alternately to the right and to the left, then overturned. The fireman was killed. The other members

of the crew were not aware of anything being wrong until the brakes were applied in emergency. The brakes of this train had been tested and had functioned properly en route.

Examination of the speed-recorder tape of the engine indicated that the speed of First 15 was 68 miles per hour at a point 1,300 feet east of the point of derailment, then the speed increased to 69 miles per hour at the point of derailment. The tape indicated that there had been no retarding effect of the brakes prior to the derailment. After the accident, the speed recorder was tested and found to be accurate. The indicator was damaged in the accident, but it registered accurately after it was repaired. Measurements of the tires of the trailer-truck wheels and of the driving pulley disclosed that the ratio between the driving pulley and the speed recorder was such that a speed of 69 miles per hour was indicated by the speed recorder when the actual speed was 71.5 miles per hour.

When engine 907 was examined after the accident the throttle lever was in closed position, the automatic and the independent brake valves were in running position, and the reverse lever was in position for 25 percent cut-off in forward motion. The engine-truck, driving-wheel and trailer-truck assemblies were in good condition. All wheels were tight on their axles and all tires were tight on their wheels, except the left No. 3 tire, which had been knocked outward 2-5/16 inches on the wheel center as a result of the accident. Measurements of the tires, the wheels and the lateral motion were within the prescribed limits. The driving-box shoes and wedges and the radial buffer-castings were well lubricated and moved freely. The spring arrangements were maintained in good alinement, and there was no indication of unequal distribution of weight. Both tender trucks were broken and the axles were bent as a result of the derailment. There was no indication of improper side-bearing clearance. There was no mark of derailment on the flanges, treads or side surfaces of any wheel of the engine or the tender.

Examination of the track throughout a distance of one mile eastward from the point of derailment disclosed that the surface, alinement and gage were well maintained. There was no mark on the track structure indicating dragging equipment. Beginning at a point 38 feet west of the point of full curvature the south rails were canted outwardly to a point 185 feet westward, where a rail broke. This break was new and was within the joint bars at the leaving end

of the rail. There was no indication of faulty metal. The first marks on the track structure were wheel marks on the inside of the web of the south rail at a point 83.5 feet west of the first indication of disturbed track.

At the point of derailment the curvature was 7°, the superelevation was 4-5/8 inches, and the gage was 4 feet 8-5/8 inches. An east-bound passenger train passed around the curve about 16 minutes before the derailment occurred, and the engineer of this train said there was no indication of defective track.

There was no mark on the rails, between the rails or on the flanges, the treads or the side surfaces of any wheel of the engine and the tender to indicate that the wheels had touched the ground within the limits of the track structure. The drawbar and the safety bar between the engine and the tender were twisted to the left at an angle of 30 degrees at the tender end. Apparently, the train was moving at overturning speed when it entered the curve.

Because of dense fog, the engineer of First 15 was confused with respect to his location and he was not aware that his train was in the immediate vicinity of the curve on which the speed was restricted to 30 miles per hour, until he saw signal 39R, then he could not reduce speed sufficiently before the engine entered the curve. He said that usually he made a brake application at the point-of-switch-one-mile sign to reduce from 70 to 30 miles per hour. In this instance he did not see signal 48.1, the one-mile-sign or the reduce-speed sign. The flagman said that, when he proceeded eastward to provide flag protection after the accident, he watched for the one-mile sign and the reduce-speed sign but could not see them because of dense fog. These signs bear no night indication, and an engineer depends upon the reflection of the headlight for observation. During fog or storm the view of these signs is limited to a short distance and a proportionately short interval of time.

Cause

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

Dated at Washington, D. C., this tenth day of December, 1947.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.