INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 3025

THE ATCHISON, TOPEKA AND SANTA FE
RAILWAY COMPANY

REPORT IN RE ACCIDENT

NEAR ORO GRANDE, CALIF., ON

SEPTEMBER 26, 1946

SUMMARY

Railroad:	Atchison, Topeka and Santa Fe
Date:	September 26, 1946
Location:	Oro Grande, Calif.
Kind of accident:	Derailment
Train involved:	U. P. Passenger
Train number:	223
Engine number:	835
Consist:	11 cars
Estimated speed:	In excess of 75 m. p. h.
Operation:	Signal indications
Tracks:	Double; 6°03' curve; 0.445 percent ascending grade westward
Weather:	Clear
Time:	About 7:02 a. m.
Casualties:	6 killed; 132 injured
Cause:	Excessive speed on curve

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3025

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

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

November 7, 1946

Accident near Oro Grande, Calif., on September 26, 1946, caused by excessive speed on a curve.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On September 26, 1946, there was a derailment of a passenger train of the Union Pacific Railroad on the line of the Atchison, Topeka and Santa Fe Railway near Oro Grande, Calif., which resulted in the death of 5 passengers and 1 chair-car attendant, and the injury of 123 passengers, 6 dining-car employees and 3 train-service employees. This accident was investigated in conjunction with representatives of the Railroad Commission of California.

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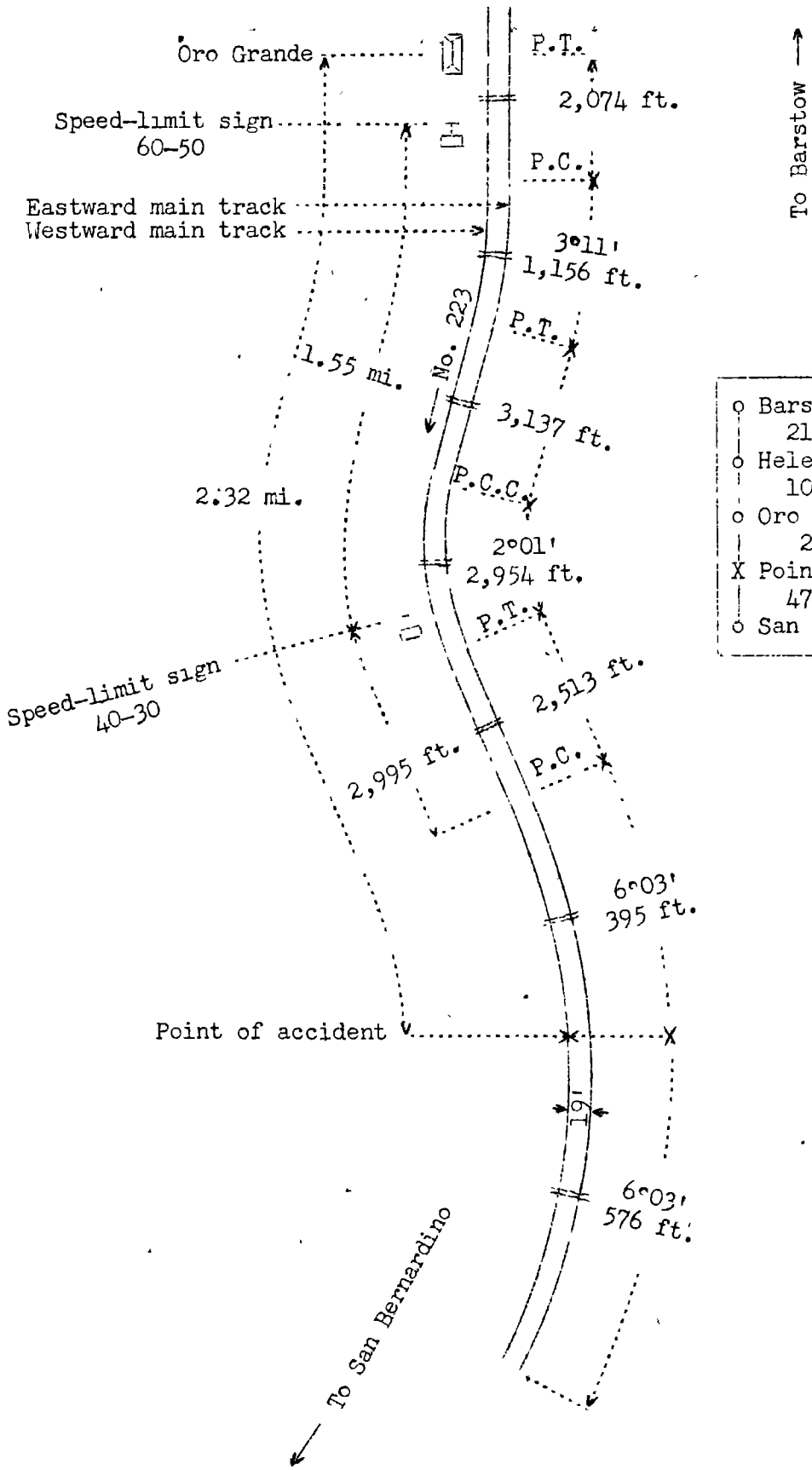
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 3025
Atchison, Topeka and Santa Fe Railway
Oro Grande, Calif.
September 26, 1946

Location of Accident and Method of Operation

This accident occurred on that part of the Los Angeles Division extending between Barstow and San Bernardino, Calif., 81.3 miles, a double-track line, over which trains moving with the current of traffic are operated by signal indications. Trains of the Union Pacific Railroad are regularly operated over this line. The accident occurred on the westward main track at a point 33.92 miles west of Barstow and 2.32 miles west of the station at Oro Grande. From the east there are, in succession, a tangent 2,074 feet in length, a 3°11' curve to the right 1,156 feet, a tangent 3,137 feet, a compound curve to the left, the maximum curvature of which is 2°01', 2,954 feet, a tangent 2,513 feet and a 6°03' curve to the right approximately 395 feet to the point of accident and 576 feet westward. The grade for west-bound trains is, successively practically level 3,600 feet, 0.49 percent ascending 1,200 feet and 0.445 percent ascending 41 feet to the point of accident and 769 feet westward. In the immediate vicinity of the point of accident, the distance between the track centers of the eastward and westward main tracks is 19 feet.

On the curve on which the accident occurred, the track structure consists of 131-pound rail, 39 feet in length, laid new in March, 1942, on 26 treated ties to the rail length. It is fully tieplated with double-shoulder canted tieplates, spiked with 4 spikes per tieplate, provided with 4-hole angle bars and an average of 8 rail anchors per rail length, and is ballasted with crushed stone and gravel to a depth of about 16 inches. The maximum superelevation on the curve was 3-1/2 inches, and the gage varied between 4 feet 8-3/8 inches and 4 feet 8-3/4 inches. At the point of derailment the superelevation was 3-3/8 inches, and the gage was 4 feet 8-3/4 inches.

Timetable special instructions prescribe the maximum authorized speed for the train involved as 90 miles per hour on tangent track, 60 miles per hour on the 3°11' curve about 1 mile east of the point of accident and 40 miles per hour on the curve on which the derailment occurred. A rectangular-shape speed-limit sign, bearing the numerals 40-30 in black on a yellow background, is located about 8 feet north of the north rail of the westward main track and 2,995 feet east of the east end of the curve on which the derailment occurred. A similar speed-limit sign, bearing the numerals 60-50, is located about 8 feet north of the north rail of the westward main track and 1.55 miles east of the first-mentioned sign.

Description of Accident

No. 223, a west-bound first-class Union Pacific passenger train, consisted of engine 835, a 4-8-4 type, one baggage car, three coaches, two dining cars and five Pullman sleeping cars, in the order named. The second, third and fourth cars were of light-weight all-steel construction, and the remainder were of conventional all-steel construction. This train departed from Barstow at 6:29 a. m., 8 minutes late, passed Helendale, the last open office, 10.4 miles east of Oro Grande, at 6:51 a. m., 3 minutes late, passed Oro Grande, and while it was moving on the westward main track at a speed estimated to have been in excess of 75 miles per hour the engine and the first six cars were derailed.

The engine overturned to the left and continued in a tangential line a distance of about 75 feet westward, where it struck the south wall of a rock cut, then it was deflected to the north and stopped on its left side on the eastward main track and at an angle of about 15 degrees to it, with the front end 459 feet west of the point of derailment. The left side of the engine was badly damaged. The tender, remaining coupled to the engine, stopped on its left side at the rear of the engine and against the south wall of the cut. The front truck of the tender was torn loose, and stopped between the main tracks opposite the rear of the tender. Separations occurred between the tender and the first car, and between the first, second, third, fourth, fifth and sixth cars. The first car stopped at the rear of the tender, practically upright, across the main tracks and at an angle of about 45 degrees to them, with the front end against the south wall of the cut and the rear end against the north wall. The second car stopped on its left side, across the main tracks and at an angle of about 75 degrees to them, with the top of the car against the left rear corner of the first car. The third car stopped practically upright, on top of the rear end of the second car and at practically right angles to it, with the front end against the left side of the first car. The fourth, fifth and sixth cars stopped practically upright, in various positions across the main tracks and at angles of about 45 degrees to the track. The derailed cars were badly damaged.

The weather was clear and it was daylight at the time of the accident, which occurred about 7:02 a. m.

The engineer, the fireman and the front brakeman were injured.

The total weight of engine 835 in working order is 490,700 pounds, distrubuted as follows: Engine truck, 100,600 pounds; driving wheels, 270,300 pounds; and trailer

truck, 119,800 pounds. The specified diameters of the engine-truck wheels, the driving wheels and the trailer-truck wheels are, respectively, 42, 80 and 42 inches. The wheelbase of the driving wheels is 22 feet long, the total length of the engine wheelbase is 50 feet 11 inches, and the total length of the engine and tender is 114 feet 2-5/8 inches. The engine truck and the trailer truck are equipped with rocker-type constant-resistance devices. The Nos. 1, 2 and 3 driving-wheel boxes are equipped with lateral cushioning devices. The tender is semi-cylindrical in shape, and is equipped with a 4-wheel truck in front and a wheel assembly at the rear of 5 pairs of wheels mounted in a rigid frame, which is cast integrally with the bed of the tender. The front truck is equipped with a roller-type lateral resistance device. Its capacity is 6,000 gallons of fuel oil and 23,500 gallons of water. The weight of the tender loaded is 411,400 pounds. A spring-type radial buffer, which is lubricated mechanically, is provided between the engine and the tender. The center of gravity of the engine is 78-3/4 inches above the tops of the rails. The center of gravity of the tender, with the calculated amount of water and fuel oil at the time of the accident, was estimated as 78-1/4 inches above the tops of the rails. The engine is provided with No. 8-ET brake equipment and two 8-1/2 inch cross-compound air compressors. The regulating devices were adjusted for brake-pipe pressure of 110 pounds and main-reservoir pressure of 130 pounds. The journals of the engine and the tender are provided with roller bearings. The last class repairs were completed during May, 1946. The accumulated mileage since the last class repairs was 71,157 miles.

Discussion

No. 223 was moving on a 6°03' curve to the right when the engine and the first six cars were derailed. The engine overturned to the left and stopped on its left side 459 feet west of the point of derailment. The maximum authorized speed for this train on tangent track was 90 miles per hour and on the curve on which the accident occurred it was 40 miles per hour.

There was no defective condition of the engine prior to the accident. There was no indication of dragging equipment, defective track, or of any obstruction having been on the track. Examination of the engine after the accident disclosed that the throttle lever was latched on the quadrant in full open position, the reverse lever was latched on the quadrant in position for about 35 percent cut-off in forward motion, the independent brake valve was in running position and the automatic brake valve was between first-service position and lap position. There was no condition found that would prevent the proper application of the train brakes.

As No. 223 was approaching the point where the derailment occurred the enginemen were maintaining a lookout ahead. The engine was not equipped with a speedometer. The conductor and the flagman were in the tenth car. The engineer said that when the engine was in the immediate vicinity of the speed-limit sign located 2,995 feet east of the east end of the curve on which the derailment occurred the speed was about 50 miles per hour, and he moved the throttle lever to drifting position and made an 8 or 10 pound brake-pipe reduction to reduce the speed of the train in compliance with the speed restriction of 40 miles per hour on the curve. When the engine entered the curve he moved the automatic brake valve to running position. The first he knew of anything being wrong was soon after the engine entered the curve when he felt the engine surge to the left, and he immediately moved the brake valve to emergency position. He thought that as the engine overturned to the left he caught hold of the throttle lever to prevent his falling from the seatbox, and that he might have moved the lever to open position. The fireman was seriously injured in the accident, and he could not be questioned during the investigation. The conductor and the flagman were unable to give an accurate estimate of the speed of the train. They thought that a heavy service application of the brakes was made several seconds before the accident occurred, but did not observe whether it was released. The cars had been riding smoothly, and the first they knew of anything being wrong was when the derailment occurred. The brakes of this train had been tested and had functioned properly en route

The surface, alinement and gage of the track on the curve were well maintained for the maximum authorized speed of 40 miles per hour. The track in this vicinity was last inspected by members of the track force on the day before the accident occurred. The engineer of a west-bound passenger train, which passed over this track about 15 minutes before the derailment occurred, said that his engine rode smoothly at a speed of 40 miles per hour, and there was no indication of defective track.

The first indication of disturbed track was at a point 470 feet west of the east end of the curve. From this point the high rail was canted outward a distance of 25 feet to its western end, and the inside spikes of this rail were raised about 1 inch. The angle bars which connected this rail with the next adjoining rail were broken. From this point westward the track was torn up to the point where the engine stopped. There was no wheel mark on any portion of the track structure immediately east of the point of derailment. Examination of the rails from the displaced section of track immediately west of the point of derailment disclosed that there was no wheel mark on any rail of this section of track. A considerable

amount of displaced material of the roadbed was pushed forward by the engine as it slid on its left side, and the front end of the engine was partially buried by this material. There was no ballast mark on any wheel of the engine or tender. This fact indicates that the wheels did not touch the ground within the limits of the ballast structure. The displacement of the track structure evidently occurred as a result of the derailment.

The general mechanical engineer said that the theoretical overturning speed for engine 835 was 76.8 miles per hour. The estimated overturning speed for the tender, with the amount of fuel and water it was calculated to have had at the time of the accident, was 78.1 miles per hour. It appears that the train was moving at overturning speed, as the engine overturned to the outside of the curve without marking the rails, and slid on its left side to the point where it stopped.

Cause

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

Dated at Washington, D. C., this seventh day of November, 1946.

By the Commission, Commissioner Patterson.

W. P. BARTEL,

SEAL Secretary.