

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3296

THE ATCHISON, TOPEKA AND SANTA FE
RAILWAY COMPANY

IN RE ACCIDENT

AT KINCAID, CALIF., ON

OCTOBER 30, 1949

SUMMARY

Date: October 30, 1949

Railroad: Atchison, Topeka and Santa Fe

Location: Kincaid, Calif.

Kind of accident: Derailment

Train involved: Passenger

Train number: 22

Engine number: Diesel-electric units
19, 19A, 19B and 19C

Consist: 13 cars

Speed: 62 m. p. h.

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

Track: Single; spiral curve; 0.59 percent
ascending grade eastward

Weather: Clear

Time: 2:22 p. m.

Casualties: 117 injured

Cause: Broken switch-rail

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3296

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

January 12, 1950

Accident at Kincaid, Calif., on October 30, 1949, caused
by a broken switch-rail.

REPORT OF THE COMMISSION¹

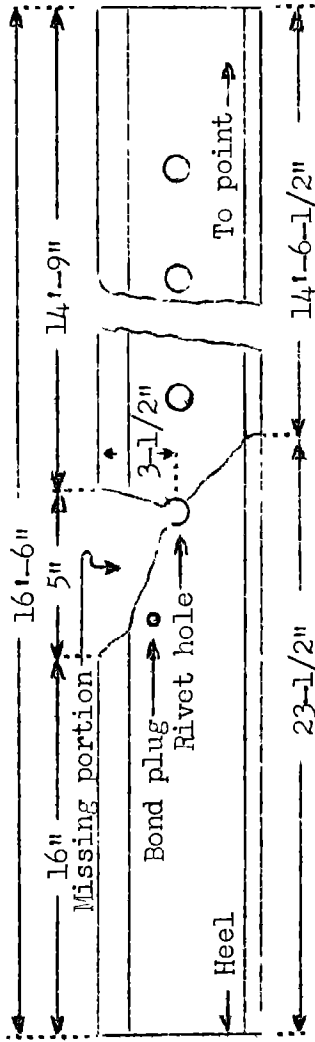
PATTERSON, Commissioner:

On October 30, 1949, there was a derailment of a passenger train on the Atchison, Topeka and Santa Fe Railway at Kincaid, Calif., which resulted in the injury of 89 passengers, 3 chair-car attendants, 21 dining-car attendants and 4 train-service employees. This accident was investigated in conjunction with a representative of the Public Utilities Commission of California.

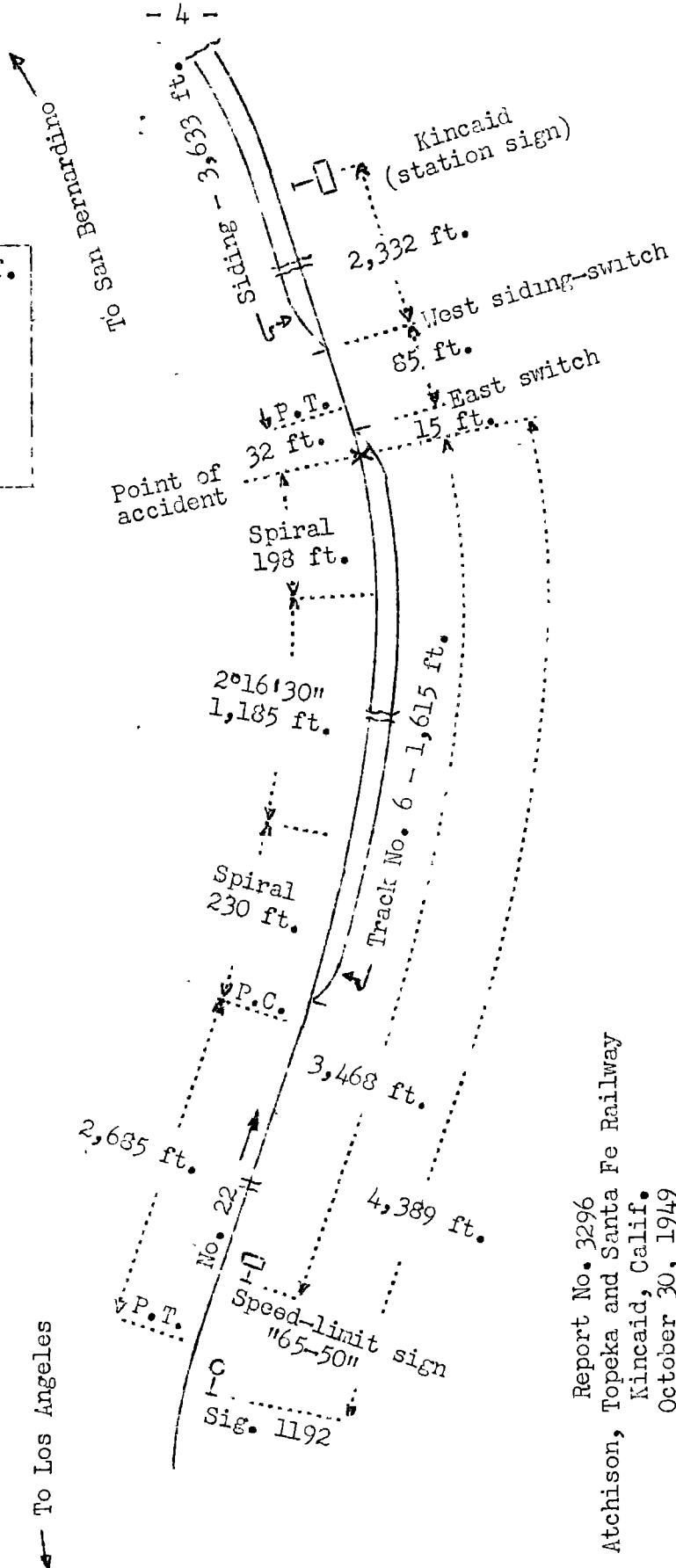
1

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.

- San Bernardino, Calif. 36.9 mi.
- X Kincaid (Point of accident) 13.5 mi.
- Pasadena 9.1 mi.
- Los Angeles, Calif.



Sketch showing broken switch rail - south side of track



Report No. 3296
 Atchison, Topeka and Santa Fe Railway
 Kincaid, Calif.
 October 30, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the Los Angeles Division extending between Los Angeles and San Bernardino, Calif., 59.5 miles. In the vicinity of the point of accident this is a single-track line, over which trains are operated by timetable, train orders and an automatic block-signal system. At Kincaid, 22.6 miles east of Los Angeles, a siding 3,635 feet in length parallels the main track on the north, and an auxiliary track 1,615 feet in length, designated as track No. 6, parallels the main track on the south. The west siding-switch is 2,332 feet west of the station sign at Kincaid, and the east switch of track No. 6 is 85 feet west of the west siding-switch. The accident occurred on the main track 15 feet west of the point-of-switch of the east switch of track No. 6. From the west there are, in succession, a tangent 2,685 feet in length, a spiral curve to the left 230 feet, a 2°16'30" curve to the left 1,185 feet and a spiral curve to the left 198 feet to the point of accident and 32 feet eastward. The grade for east-bound trains is generally ascending and is 0.59 percent ascending at the point of accident.

The track structure of the main track consists of 110-pound rail, 39 feet in length, laid new in 1926 on an average of 25 treated ties to the rail length. It is fully tieplated with single-shoulder tieplates, single-spiked, and is provided with 4-hole 26-inch 100-percent joint bars and 10 rail anchors per rail length. It is ballasted with 9-1/2 inches of crushed stone and gravel below the bottoms of the ties. The specified superelevation on the 2°16'30" curve is 3 inches. The run-off extends throughout the length of the spiral. At a point 6 feet west of the point of accident, the superelevation was 1 inch and the gage was 4 feet 8-1/2 inches.

The east turnout of track No. 6 is constructed of 110-pound rail and is provided with a No. 10 spring-rail frog 16-1/2 feet in length, reinforced switch-rails 16-1/2 feet in length, 11-foot clamped guard rails and single-shoulder canted tieplates. The heel of each switch-rail is of full section. The head and the base are planed and chamfered to fit properly against the stock rails. The reinforcing of each switch-rail consists of a 1/2-inch steel bar, 15 feet in length, which extends the full width of the web. The reinforcing bar is riveted to the switch-rail on the gage side by sixteen 7/8-inch rivets. The two switch-rails are held in proper relation to each other by two switch-rods

2-1/2 inches wide and 1 inch thick. A cast-iron heel block, 22 inches in length, is provided at the heel of each switch-rail to anchor it rigidly to its stock rail. The east end of the joint bar on the gage side of each switch-rail is bent slightly outward to permit free movement of the switch-rails when the switch is operated. When the switch is operated the switch-rails move on slide plates. The rail from which the switch-rails were manufactured was rolled in 1925 by the Colorado Fuel & Iron Corporation. The heat number was 1830. The switch-rails were manufactured at the carrier's Newton rail shop.

Automatic signal 1192, governing east-bound movements, is located 4,389 feet west of the point of accident. This signal is of the color-light type and displays three aspects. It is continuously lighted. Each switch-rail was bonded from the heel to the closure rail to which it was joined and the closure rail was bonded to the respective stock rail. The switch-rails, therefore, did not form a part of the track circuit with respect to continuity of the circuit. A switch circuit controller was connected to the normally closed switch-point to cause signal 1192 to display its most restrictive aspect when the normally closed switch-point was open 1/4 inch or more. A speed-limit sign bearing the numerals "65-50" is located south of the main track and 3,468 feet west of the point of accident.

This carrier's maintenance-of-way rules read in part as follows:

147. Inspection.--Careful attention must be given daily to main track switches, frogs, guard rails and derails to see that they are in proper repair, line, gage, and surface; that all movable parts work easily and without excessive lost motion; that all bolts and nuts are tight, cotter pins in place and properly spread, that connecting rods are properly secured so that they cannot drop down and cause derailment, and that switch points fit closely against the rail and otherwise are in safe condition. * * *

* * *

Uniform Maintenance Practices - Instructions to Track Supervisors, read in part as follows:

4. Make daily motor car inspection trip over territory and walk track where required for adequate inspection. Walk or pass slowly over main track switches to see that they are in proper condition.
* * *

* * *

6. Make detailed inspection of main track switches, frogs, guard rails and derails at intervals of not over sixty days as outlined in the first paragraph of Maintenance of Way Rule 147. Inspect adjustment of switch points, wear on bolts, switch points, frogs, connecting rods and other wearing parts; * * *

The maximum authorized speed for the train involved was 100 miles per hour but it was restricted to 65 miles per hour in the vicinity of the point of accident.

Description of Accident

No. 22, an east-bound first-class passenger train, consisted of Diesel-electric units 19, 19A, 19B and 19C, coupled in multiple-unit control, one baggage car, one baggage-dormitory car, two chair cars, one dining car, two chair cars, one lounge car, two chair cars, one dining car, one chair car and one observation car, in the order named. The baggage cars were of stainless steel construction and the other cars were of lightweight steel construction. This train departed from Pasadena, the last open office, 13.5 miles west of Kincaid, at 2:01 p. m., 1 minute late, passed automatic signal 1192, which indicated Proceed, and while moving at a speed of 62 miles per hour the four Diesel-electric units and the first seven cars were derailed at the east switch of track No. 6.

The Diesel-electric units and all of the cars were equipped with controlled slack couplers. Separations occurred between all adjacent units from the front of the train to the fifth car. The first Diesel-electric unit stopped on its right side, south of the main track and parallel to it, with its east end 560 feet east of the point of accident. The second unit stopped on its left side at the rear of the first unit, across the main track and the siding. The third unit stopped opposite the second unit, 40 feet north

of the siding and leaned at an angle of 30 degrees to the north. The fourth unit stopped across the main track and the siding and leaned toward the east at an angle of 40 degrees. The first car stopped to the rear of the fourth Diesel unit and across both tracks. The second car stopped directly behind the first car and across both tracks. The third and the fourth cars stopped across both tracks. The fifth car stopped upright, with its east end 18 feet south of the track and its west end on the roadbed. The sixth and seventh cars remained upright and on the roadbed. The coupler shank at the west end of the fourth Diesel-electric unit was broken. The four Diesel-electric units were badly damaged, and the first unit was also damaged by fire resulting from a punctured fuel tank. Two of the derailed cars were badly damaged and five were slightly damaged.

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

The weather was clear at the time of the accident, which occurred at 2:22 p. m.

Discussion

No. 22 was moving on the leaving spiral of a 2°16'30" curve to the left at a speed of 62 miles per hour, in territory where the maximum authorized speed was 65 miles per hour, when the derailment occurred. As the train approached the point where the accident occurred the engineers were maintaining a lookout ahead from their respective positions in the control compartment of the first Diesel-electric unit. The front brakeman was in the second car, the conductor was in the fourth car, the assistant conductor was in the twelfth car and the flagman was in the rear car. Signal 1192, governing east-bound movements in the block in which the accident occurred, indicated Proceed. Prior to the time of the accident, the Diesel-electric units and the cars had been riding smoothly, and there was no indication of defective equipment or track, nor of any obstruction having been on the track. The engineer said there was an unusual sound underneath the first Diesel-electric unit as it was passing over the east switch of track No. 6 at Kincaid. He immediately initiated an emergency brake application.

Examination of the track after the accident occurred disclosed that the normally closed switch-rail of the east switch of track No. 6 was broken. The break was a progressive fracture. It occurred about 2 inches east of the easterly edge of a switch tie. A section at the heel of the switch-rail measuring 16 inches along the head and 23-1/2 inches along the base remained bolted in place. Another section measuring 14 feet 9 inches along the head and 14 feet 6-1/2 inches along the base was lying on the ties, between the rails and approximately 2-1/2 feet east of its original position. A triangular section of the head and web of the rail 5 inches in length measured along the head and extending downward about 3 inches to a rivet hole was not recovered. The metal was discolored throughout a distance of about 3/16 inch from the base. This condition indicated that the fracture had existed for some time prior to the derailment. The head of the rail on each side of the missing section was heavily battered. On the east end of the break there were flange marks on top of the rail which extended diagonally to the gage side. These marks indicated that wheels had mounted the rail at the break and then had dropped back into their normal position on the rail. At the lower portion of the rivet hole a lip had been formed on either side of the web.

Apparently the initial break was across the base of the switch-rail, and it progressed upward to the rivet hole and then diagonally upward through the head. After the break occurred, the point end of the rail was held in position only by the two switch rods which were connected near the point. The battering on either side of the break indicated that the triangular section which was not recovered was broken by a preceding train. Apparently the point end of the switch-rail was moved out of alignment by a train preceding No. 22, and then the free end was dislodged and overturned by the first Diesel-electric unit of No. 22.

About 1 hour before the accident occurred an east-bound passenger train passed over the involved switch-rail at a speed of about 60 miles per hour. The front brakeman and two club-car attendants said they were in the front portion of the third car. When this car passed the point where the accident occurred they heard an unusual sound and felt the car lurch excessively. The front brakeman inspected each side of the car but observed no unusual condition. He did not report the abnormal movement of the car.

The switch-rail involved was installed about September, 1948. It was last tested by a rail-defect detector car on April 22, 1949, at which time no defective condition was indicated. The roadmaster passed over this switch on a track motor-car on October 27, 1949, and no defective condition was observed. The accident occurred on a Sunday and no inspection was made on that day, but the track supervisor inspected the switch on the preceding day and found no defective condition.

Cause

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

Dated at Washington, D. C., this twelfth day of January, 1950.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.