INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3603

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

IN RE ACCIDENT

NEAR SIAM, CALIF., ON

NOVEMBER 24, 1954

35-E

SUMMARY

Date:	November 24, 1954
Railroad:	Atchison, Topeka and Santa Fe
Location:	Siam, Calif.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	20
Engine number:	Diesel-electric units 16C, 16B, 16A, and 16
Consist:	11 cars
Speed:	75 m. p. h.
Operation:	Signal indications
Track:	Double; spiral; 0.67 percent ascending grade eastward
Weather.	Clear
Time:	9:02 p. m.
Casualties:	69 injured
Cause:	Broken rail

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3603

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 20, 1955

Accident near Siam, Calif., on November 24, 1954, caused by a broken rail.

REPORT OF THE COMMISSION[1]

CLARKE, Commissioner:

On November 24, 1954, there was a derailment of a passenger train on the Atchison, Topeka and Santa Fe Railway near Siam, Calif., which resulted in the injury of 46 passengers, 4 Pullman Company employees, and 19 dining-car employees.

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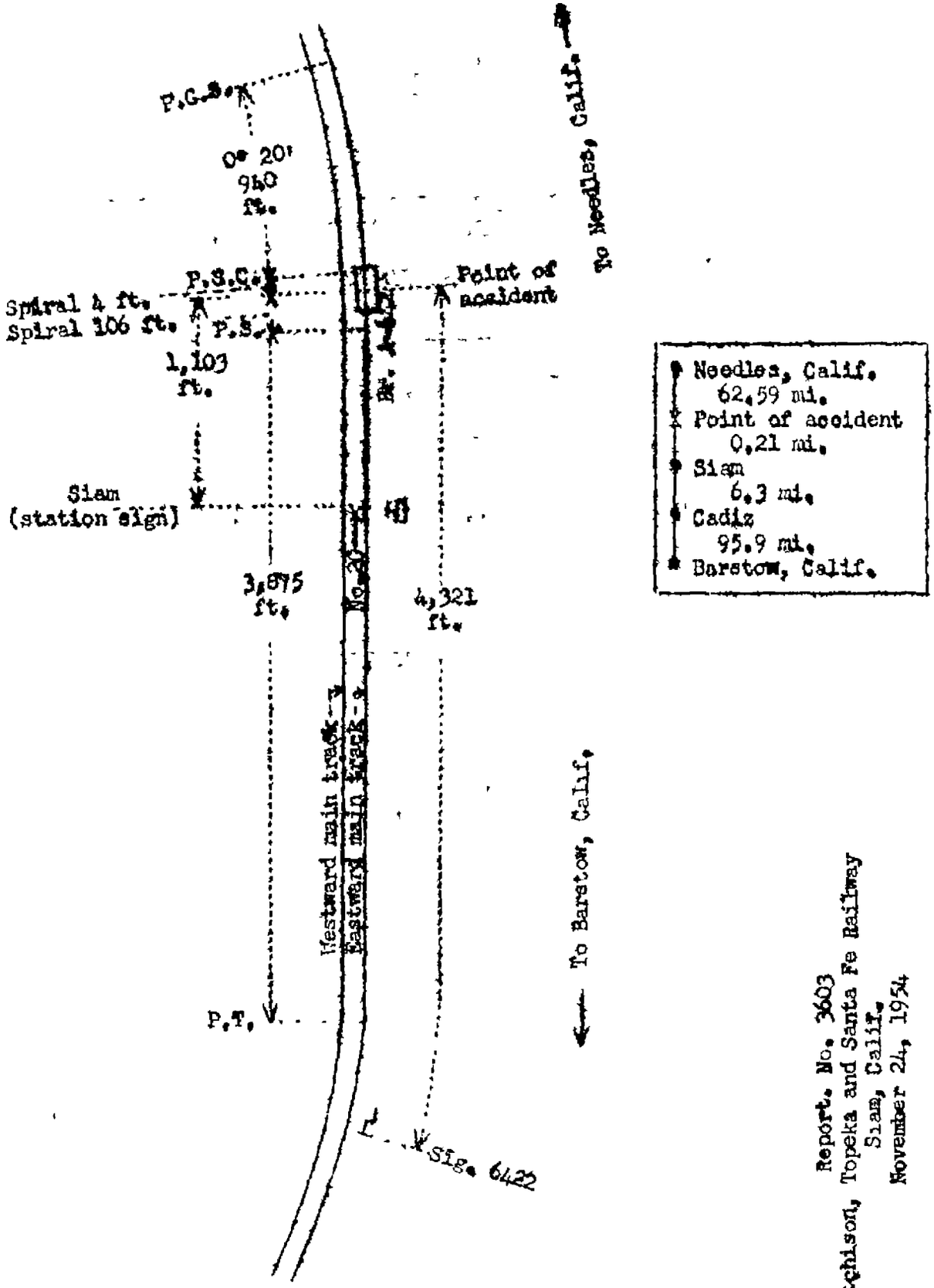
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Clarke for consideration and disposition.



Report No. 3603
Atchison, Topeka and Santa Fe Railway
Siam, Calif.
November 24, 1954

Location of Accident and Method of Operation

This accident occurred on that part of the Los Angeles Division extending between Barstow and Needles, Calif., 165.0 miles. In the vicinity of the point of accident this is a double-track line, over which trains moving with the current of traffic are operated by signal indications supplemented by an intermittent inductive automatic train-stop system. The accident occurred on the eastward main track at a point 102.41 miles east of Barstow and 1,133 feet east of the station sign at Siam. From the west on the eastward main track there are, in succession, a tangent 3,875 feet in length, a spiral 106 feet to the point of accident and 4 feet eastward, and a 0°20' curve to the left 940 feet. The grade is 0.67 percent ascending eastward at the point of accident.

In the vicinity of the point of accident the track structure consists of 112-pound rail, 39 feet in length, laid new in 1937 on an average of 25 treated ties to the rail length. It is fully tieplated with double-shoulder tieplates and is spiked with two rail-holding spikes per tieplate, plus two plate-holding spikes per tieplate on the joint ties. It is provided with 4-hole 24-inch joint bars and an average of eight rail anchors per rail, and is ballasted with crushed rock to a depth of 3-1/2 inches below the bottoms of the ties on 10 inches of gravel sub-ballast.

At the point of accident the eastward main track is laid on a ballast-deck timber trestle 28 feet in length. The accident occurred 10 feet west of the east end of the bridge.

Automatic signal 6422, governing east-bound movements, is located 4,321 feet west of the point of accident.

The maximum authorized speed for passenger trains in the vicinity of the point of accident is 75 miles per hour.

Description of Accident

No. 20, an east-bound first-class passenger train, consisted of Diesel-electric units 16C, 16B, 16A, and 16, coupled in multiple-unit control, one dormitory car, three chair cars, two dining cars, one lounge car, and four sleeping cars, in the order named. All cars were of lightweight steel construction. The eighth, ninth, and eleventh cars were equipped with

tightlock couplers, and the other cars were equipped with controlled slack couplers. This train departed from Barstow at 7:38 p. m., 5 minutes late, passed Cadiz, 6.3 miles west of Siam, the last open office, at 8:57 p. m., 9 minutes late, passed signal 6422, which indicated Proceed, and while moving at a speed of 75 miles per hour the rear wheels of the rear truck of the fourth car, and the fifth to the eleventh cars, inclusive, were derailed, the initial point of derailment being 1,133 feet east of the station sign at Siam.

A separation occurred between the sixth and the seventh cars. The train stopped with the west end of the sixth car 1,906 feet east of the point of accident and the west end of the eleventh car 88 feet east of the point of accident. The derailed cars remained upright, to the north of the track and approximately in line with it. These cars were somewhat damaged.

The weather was clear at the time of the accident, which occurred at 9.02 p. m.

Discussion

As No. 20 was approaching the point where the accident occurred the speed was 75 miles per hour, as indicated by the speed indicator. The enginemen were in the control compartment at the front of the locomotive, the conductor and the front brakeman were in the first car, and the flagman was in the eleventh car. Signal 6422 indicated Proceed. The enginemen said that the locomotive was riding smoothly and until the front of the train reached the bridge on which the accident occurred there was no indication of defective track or equipment. As the locomotive was passing over this bridge they felt a slight bump. The fireman looked back and observed sparks flying from underneath the train. He called a warning to the engineer, and at approximately the same time the brakes became applied in emergency as a result of the derailment. The front brakeman said that immediately before the brakes became applied he felt an indication of what he thought was a slight irregularity in the track. The other members of the train crew were not aware that anything was wrong until the brakes became applied.

Examination of the locomotive and cars after the accident occurred disclosed no condition of train equipment which could have caused or contributed to the cause of the accident. Examination of the track disclosed no indication of dragging equipment nor of an obstruction having been on the track.

After the accident occurred a broken rail was found in the north side of the track on the trestle. The rail was broken into several pieces. The first fracture extended diagonally upward through the web from the receiving end of the rail, through the first bolt hole, and through the head at a point 6 inches east of the end of the rail. Another break extended diagonally downward from the first break in the underside of the head, through the second bolt hole, and through the base at a point approximately 10 inches east of the end of the rail. The outside joint bar at this joint was broken vertically through the center. The 6-inch section of the head and web at the end of the rail was not recovered. The head of the rail east of the missing section was heavily battered. East of this point the track was destroyed throughout a distance of approximately 500 feet.

This rail was rolled by the Colorado Fuel and Iron Corporation in January, 1935, and bore heat number 5019-B, Ingot 19. It was laid in the track at the point of accident in October, 1953.

According to the report of the engineer of tests of the carrier, the chemical content of the broken rail was as follows:

	O-Outside	M-Middle	AREA Spec.
Carbon	0.72	0.75	0.67 - 0.80
Manganese	0.74	0.73	0.70 - 1.00
Phosphorus	0.040	0.042	0.04 Max.
Sulphur	0.029	0.029	-
Silicon	0.16	0.16	0.10 - 0.23

Examination of the rail indicated that the primary fracture originated at the first bolt hole and rapidly progressed diagonally upward through the head and downward through the web to the end of the rail. A battered condition of the fracture face at the bolt hole had obliterated any evidence of an old progressive break. The secondary fracture through the second bolt hole appeared to be new and probably resulted from wheel impacts after the 6-inch section of the head became displaced. Batter on the fracture faces indicated that the triangular section of the web and base was held in place by the joint bars for some length of time after the break occurred. The fracture face of the broken joint bar revealed approximately 20 percent old progressive break which developed into final failure after the end of the rail was broken.

In January, 1954, this section of track was tested by a portable device used to detect rail defects within joint-bar limits and at like locations, and a rail-defect detector car was last operated over this territory in October, 1954. No defective condition of the rail involved was indicated. The track in the vicinity of the point of accident was last inspected by the track supervisor on the day before the accident occurred. No defective condition was observed. The track supervisor said that some difficulty had been experienced in maintaining the cross level at the joint at which the failure occurred and that it had been necessary to raise and tamp this joint at intervals. The joint had last been tamped on November 19, 1954.

Cause

This accident was caused by a broken rail.

Dated at Washington, D. C., this twentieth day of January, 1955.

By the Commission, Commissioner Clarke.

(SEAL)

GEORGE W. LAIRD,

Secretary.