INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3274

ST. LOUIS-SAN FRANCISCO RAILWAY COMPANY

IN RE ACCIDENT

NEAR SEVENTY-SIX, MO., ON

SEPTEMBER 12, 1949

SUMMARY

Date:	September 12, 1949
Railroad:	St. Louis-San Francisco
Location:	Seventy-Six, Mo.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	Extra 4107 South
Engine number:	4107
Consist:	Auxiliary water car, 55 cars, caboose
Speed:	15 m. p. h.
Operation:	Timetable, train orders and automatic block-signal system
Track:	Single; tangent; level
Weather:	Raining
Time:	11:35 p. m.
Casualties:	3 killed
Cause:	Collapse of a bridge

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3274

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

ST. LOUIS-SAN FRANCISCO RAILWAY COMPANY

October 31, 1949

Accident near Seventy-Six, Mo., on September 12, 1949, caused by the collapse of a bridge.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On September 12, 1949, there was a derailment of a freight train on the St. Louis-San Francisco Railway near Seventy-Six, Mo., which resulted in the death of three employees.

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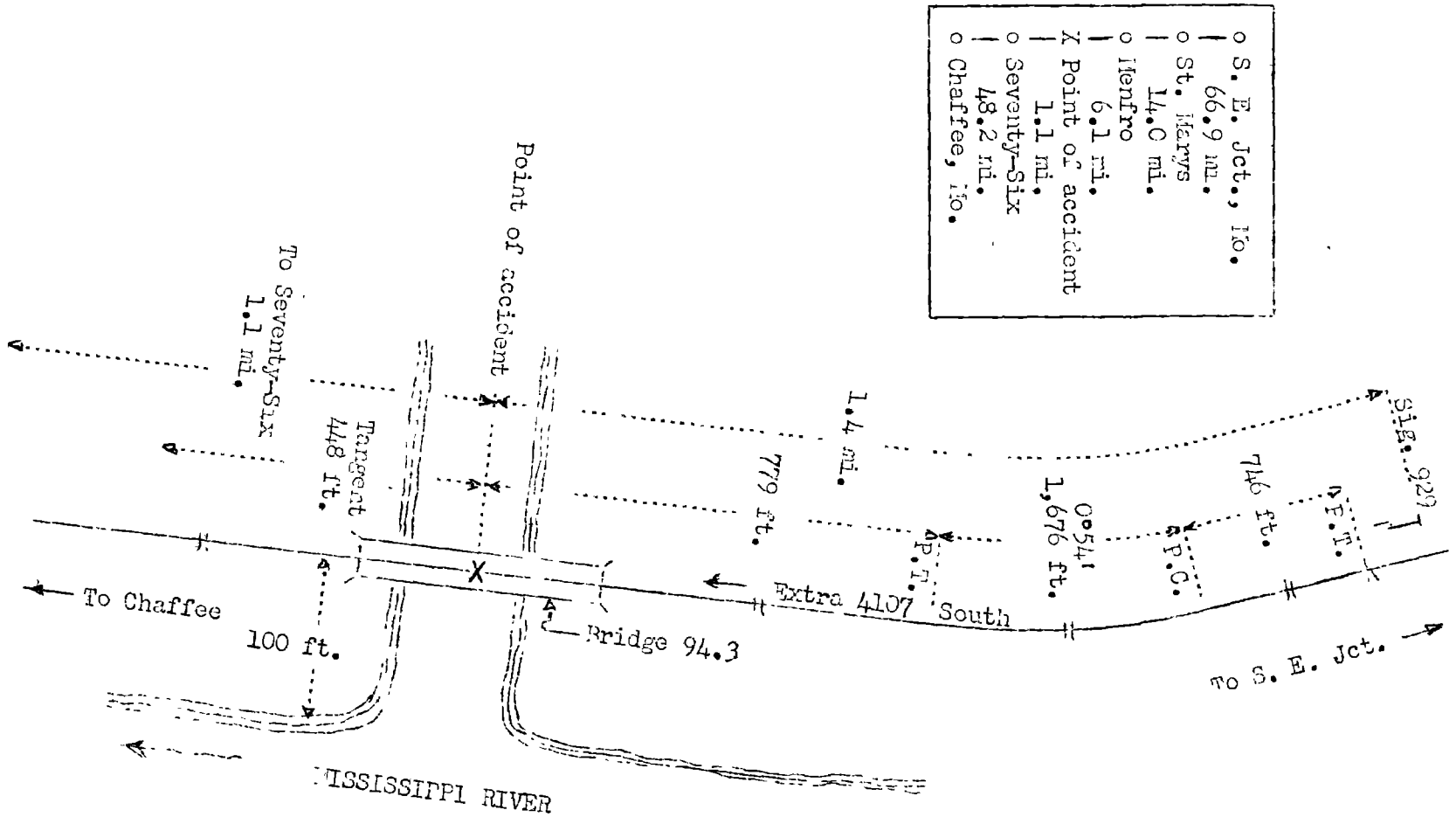
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Report No. 3274
St. Louis-San Francisco Railway
Seventy-Six, Mo.
September 12, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the River Division extending between S. E. Jct., near St. Louis, and Chaffee, Mo., 136.3 miles, a single-track line, over which trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred on the main track at Bridge 94.3, 87 miles south of S. E. Jct., and 1.1 miles north of the station at Seventy-Six. From the north there are, in succession, a tangent 746 feet in length, a 0°54' curve to the right 1,676 feet and a tangent 779 feet to the point of accident and 448 feet southward. The grade is practically level.

The track structure consists of 90-pound rail, 33 feet in length, laid new in 1922 on an average of 20 treated ties to the rail length. It is fully tieplated, single-spiked, and is provided with 4-hole toeless joint bars 24 inches in length and an average of 6 rail anchors per rail length. It is ballasted with chats to a depth of 12 inches under the ties. In the immediate vicinity of the point of accident the track is laid on a fill having an average height of about 5 feet. Bridge 94.3 was constructed in 1926. It was an 11-span, ballast-deck, creosoted pile trestle, 143 feet in length. Each bent consisted of 6 creosoted piles, spaced 2 feet 6 inches between centers at the top. The piles were driven on a batter varying between 3/8 inch in 12 inches for the two center piles and 1-7/8 inches in 12 inches for the two outside piles. The piles of each bent were connected to each other by 3-inch by 10-inch sash and sway braces. Each bent was provided with a 14-inch by 14-inch cap. The bents were connected to each other by 10 8-inch by 16-inch creosoted stringers. A ballast deck was superimposed on the stringers. The piles of the center bents were about 40 feet in length. They were driven about 22 feet to a hard stratum of shelly rock or gravel. The piles did not penetrate this stratum. The normal ground level under the bridge was about 18 feet below the base of the rail. The drainage area of the stream spanned by Bridge 94.3 was about 1.56 square miles, and the bridge opening was approximately seven times larger than was necessary to admit the normal run off from this area. This large opening was provided as a safeguard against back water from the Mississippi River, located about 100 feet east of the track and parallel to it.

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

GENERAL RULES

DISPATCHERS

854. Upon receiving reports of storms, high water, defective track or other conditions affecting the safety of trains, they must take such action, by the issuance of restricting train orders, or by any other method as necessary, to insure safety.

This carrier's rules for the maintenance-of-way and structures read in part as follows:

SECTION FOREMEN

320. Storms, High Water. During storms or nigh water, whether by day or by night, whereby tracks or structures are liable to be damaged, section foremen and such of their forces as they deem necessary must be on duty. At such times, they must go over their sections to make sure that the track is safe, * * *

321. Patrolling Track. They must see that watchmen are properly detailed to patrol the track; watch bridges or perform other duties, whenever necessary, for the safety of track and structures.

Automatic signal 929, governing south-bound movements, is located 1.4 miles north of the point of accident. This signal is of the semaphore type and is approach lighted.

The maximum authorized speed for freight trains is 50 miles per hour.

Description of Accident

Extra 4107 South, a south-bound freight train, consisted of engine 4107, a 2-8-2 type, 1 auxiliary water car, 55 cars and a caboose. This train departed from St. Marys, the last open office, at 10:12 p. m., stopped at mileposts 91.5 and 91.65 because of land slides, and while moving at an estimated speed of 15 miles per hour over Bridge 94.3 it was derailed.

Engine 4107 was derailed to the west and was badly damaged. It stopped on its right side, with the front end on the south bank of the stream, about 15 feet west of the track, and 30 feet below the level of the track. The tender telescoped the cab. The auxiliary water car stopped east of the tender. The first to the sixth cars, inclusive, were derailed and stopped at various angles either in the channel or in the ravine. The seventh car stopped on the embankment, north of the stream and west of the track. All of these cars were badly damaged.

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

It was raining at the time of the accident, which occurred at 11:35 p. m.

Engine 4107 is of the 2-8-2 type, and its total weight including the tender is 581,800 pounds.

Discussion

About 3 hours before the accident occurred, the dispatcher received information of heavy rain between Chaffee and S. E. Jct., and issued train order No. 128 instructing train crews to be on the alert at locations likely to be affected because of excessive rain. This order was addressed to all north-bound trains at Chaffee, to all south-bound trains at S. E. Jct., and to Extra 4123 North at St. Marys. It was not addressed to Extra 4107 South because, from the information the dispatcher received, he thought that Extra 4107 South was south of the heaviest rainfall. Extra 4107 South met Extra 4123 North at St. Marys. Extra 4123 North had encountered unusually heavy rain south of St. Marys, and the front brakeman boarded engine 4107 and informed the engineer and the front brakeman of the heavy rain and cautioned them to be on the alert for land slides. Extra 4107 South departed from St. Marys at 10:12 p. m. and proceeded at reduced speed. In the vicinity of mile post 91, about 3 miles north of Bridge 94.3, two small land slides were found, and the train was stopped at each of them. At the second stop the conductor instructed the flagman to return to Menfro, 7.2 miles north of Seventy-Six, to notify the section foreman and the operator. The train then departed and was moving at an estimated speed of 15 miles per hour when the engine and the first seven cars were derailed at Bridge 94.3. The conductor, who was on the rear platform of the caboose, said that the brakes were not applied before the derailment occurred.

Examination of the bridge after the accident occurred disclosed that five bents had collapsed, and as a result the engine and the first six cars had dropped into the stream. From north to south, bents 1, 2, and 3 and two panels of the deck were intact. The piles in bent 4 were broken. Bents 5, 6, and 7 were carried away by the stream. Three of the six piles in bent 8 were in place and the last four bents and the three panels of the deck were intact. Three piles of bent 4 were removed, and the driven ends were found to be excessively broomed. The high water mark was approximately 17 feet below the base of the rail, but the bed of the stream had been washed away to a depth of 15 feet below its normal level. Examination of the track north of the bridge and of the equipment of Extra 4107 South disclosed no condition which would have caused or have contributed to the cause of the accident. There was no indication that drift had become lodged against any of the bents.

The investigation disclosed that normally there is no water flowing under Bridge 94.3, although usually there is backwater from the Mississippi River, which is about 100 feet east of the track. The stream descends toward the river at a rate of about 80 feet per mile. In the past, when there was sufficient rainfall to cause water to flow, its velocity under the bridge was sufficiently retarded by the backwater to prevent excessive scouring of the stream bed under the bridge. On the day of the accident a heavy rainfall occurred in the vicinity of Seventy-Six between 3:30 p. m. and the time the accident occurred. Members of the crew of Extra 4123 North, which passed over Bridge 94.3 about 2 hours 30 minutes before the accident occurred, said there was an abnormal rainfall while they were in the vicinity of Seventy-Six. However, they noticed no unusual condition of the bridge when they passed over it. There is no record of the amount of rainfall in the drainage area west of Bridge 94.3, but at Chester, Ill., about 15 miles north of Seventy-Six, the rainfall during the 24-hour period ending at 7 a. m., September 13, was 6 inches. The Mississippi River was at a low stage and there was very little backwater under the bridge. As a result, the velocity of the water flowing under the bridge was not retarded and the stream bed was scoured away. The piles of the center bents were about 40 feet in length. The record of penetration obtained when they were driven in 1926 was not available. However, the estimated penetration based on ravine section was 27 feet for bent 4, 21 feet for bent 5, 15 feet for bent 6, 14 feet for bent 7, and 18 feet for bent 8. Since the stream bed was washed away to a maximum depth of 15 feet,

there was not sufficient penetration remaining of the piles of the center bents to hold the bridge in place under a moving train. Apparently the track and the bridge were in normal alinement and surface as Extra 4107 South approached it and the enginemen were not aware of its weakened condition, as no action was taken to stop the train. The train was not stopped at signal 929, which, apparently, displayed an aspect to proceed.

The rules provide that section foremen shall patrol their sections during stormy weather when they consider it necessary. The section foreman at Seventy-Six had been in charge of that section for only seven days and he did not consider the storm severe enough to make patrolling of the track necessary. However, one of the sectionmen, who had worked on the section about 17 years, patrolled the track, on his own initiative, from mile post 99.1 northward to Seventy-Six, about 4 miles. When he arrived at Seventy-Six about midnight, he called the section foreman and another sectionman and they patrolled the track northward to Bridge 94.3, where they discovered that Extra 4107 South had been derailed. The section foreman said that because of the high water under the bridge he probably would not have discovered the weakened condition of Bridge 94.3 if he had patrolled the track earlier.

This bridge was inspected by a bridge inspector on August 12. On August 15 it was inspected by the bridge inspector and a bridge and building foreman. On both dates it was found to be in good condition. On August 15 the ground line under the bridge was about 18 feet below the base of the rail.

Cause

It is found that this accident was caused by the collapse of a bridge.

Dated at Washington, D. C., this thirty-first day of October, 1949.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.