

INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 3207

SOUTHERN PACIFIC COMPANY

REPORT IN RE ACCIDENT

AT BLUE CANON, CALIF., ON

OCTOBER 8, 1948

SUMMARY

Railroad: Southern Pacific

Date: October 8, 1948

Location: Blue Canon, Calif.

Kind of accident: Rear-end collision

Trains involved: Freight : Engine

Train numbers: Extra 4224 West : Extra 4249 West

Engine numbers: 4224 : 4249

Consists: 85 cars, caboose :

Estimated speeds: Standing : 25 m. p. h.

Operation: Timetable, train orders and automatic  
block-signal and train-stop systems

Tracks: Double; tangent; 1.93 percent  
descending grade westward

Weather: Clear

Time: 1:05 p. m.

Casualties: 2 killed

Cause: Failure to operate following train  
in accordance with signal indications

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3207

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

SOUTHERN PACIFIC COMPANY

December 20, 1948

Accident at Blue Canon, Calif., on October 8, 1948, caused  
by failure to operate the following train in accordance  
with signal indications.

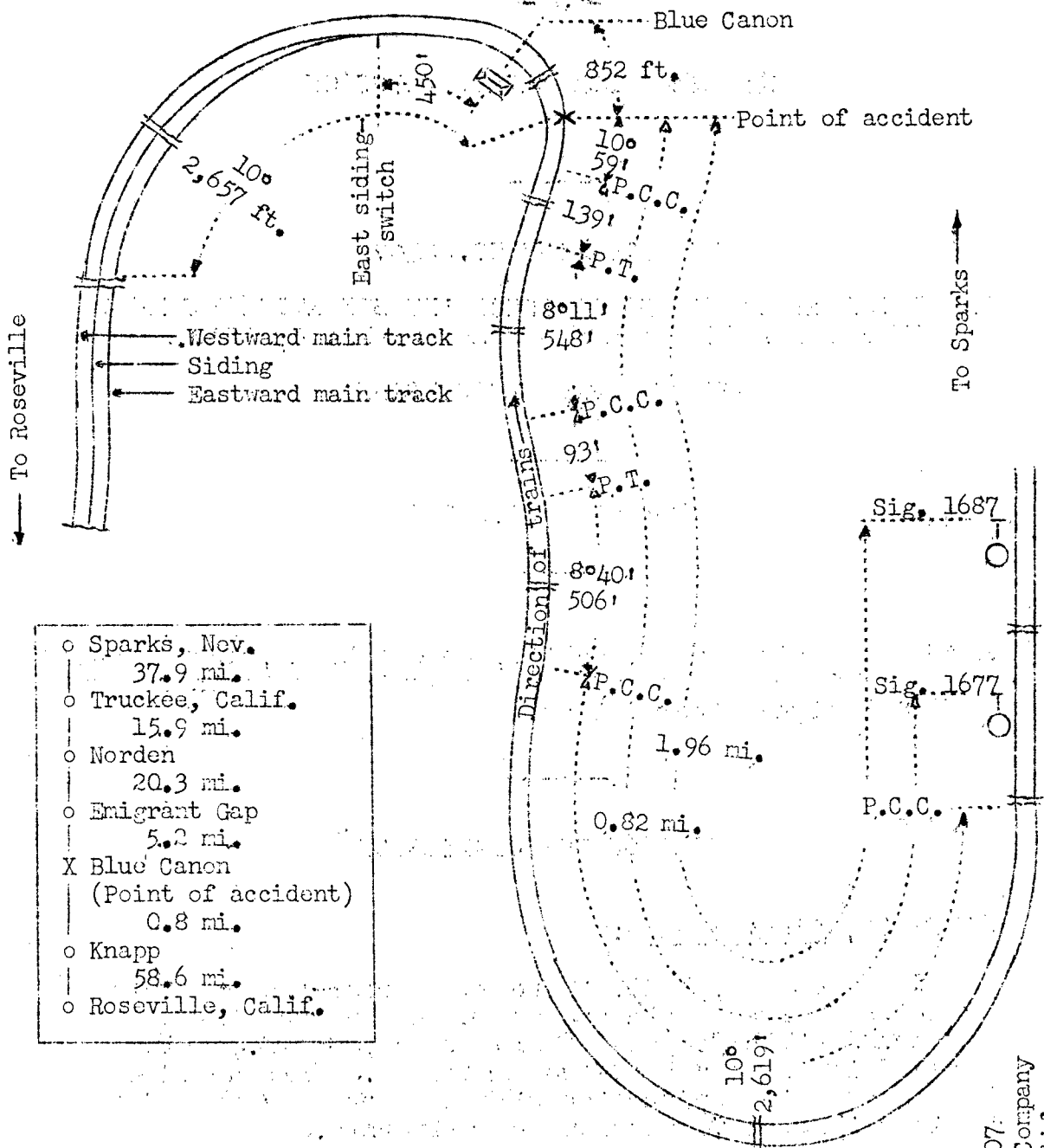
REPORT OF THE COMMISSION<sup>1</sup>

PATTERSON, Commissioner:

On October 8, 1948, there was a rear-end collision between a freight train and an engine on the line of the Southern Pacific Company at Blue Canon, Calif., which resulted in the death of two employees. This accident was investigated in conjunction with a representative of the Public Utilities Commission of California.

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<sup>1</sup> 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.



o	Sparks, Nev.	37.9 mi.
o	Truckee, Calif.	15.9 mi.
o	Norden	20.3 mi.
o	Emigrant Gap	5.2 mi.
X	Blue Canon (Point of accident)	0.8 mi.
o	Knapp	58.6 mi.
o	Roseville, Calif.	

Inv. No. 3207  
 Southern Pacific Company  
 Blue Canon, Calif.  
 October 3, 1948

Location of Accident and Method of Operation

This accident occurred on that part of the Sacramento Division extending between Sparks, Nev., and Roseville, Calif., 138.7 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 timetable, train orders and an automatic block-signal system supplemented by an automatic train-stop system. The accident occurred on the westward main track at a point 79.3 miles west of Sparks and 852 feet east of the station at Blue Canon. From the east there are, in succession, a compound curve to the right, having a maximum curvature of 10°, 2,619 feet in length; a compound curve to the left, having a maximum curvature of 8°40', 506 feet; a tangent 93 feet; a compound curve to the right, having a maximum curvature of 8°11', 548 feet; a tangent 139 feet; and a compound curve to the left, having a maximum curvature of 10°, 59 feet to the point of accident and 2,657 feet westward. Throughout a distance of 1 mile immediately east of the point of accident the grade for west-bound trains varies between 2.08 percent and 1.93 percent descending, and is 1.93 percent descending at the point of accident.

Automatic signals 1687 and 1677, governing west-bound movements on the westward main track, are, respectively, 1.96 miles and 0.82 mile east of the point of accident. These signals are of the color-light type. They display three aspects, and are approach lighted. The involved aspects and corresponding indications are as follows:

<u>Aspect</u>	<u>Indication</u>
Yellow	Proceed prepared to stop at next home signal
Red	Stop

The automatic train-stop system is of the intermittent magnetic-induction type. A control valve, which contains permanent magnets affected by the field of track magnets, is located immediately behind the pilot of an engine. Track magnets are provided at each signal, are located between the rails of the track and are so controlled that when a signal displays a restrictive aspect the control valve on the engine is automatically actuated to initiate a full-service application of the brakes. Each engine also is equipped with a valve by which an engineer can forestall an automatic application of the brakes at a restrictive signal. A track magnet is located 120 feet west of signal 1677.

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, such as \*\*\* automatic \*\*\* signal; \*\*\*

With Caution--To run at reduced speed, according to conditions, prepared to stop short of a train, \*\*\* or other obstruction, or before reaching a stop signal. Where circumstances require, train must be preceded by a flagman; \*\*\*

14. ENGINE WHISTLE SIGNALS

Note--The signals prescribed are illustrated by "o" for short sounds; "\_\_\_" for longer sounds. \*\*\*

SOUND	INDICATION
*** (e) o___o___o___o___	Flagman may return from east as prescribed by Rule 99.

\*\*\*  
15. \*\*\*

The explosion of two torpedoes is a signal to proceed with caution for not less than one mile.

\*\*\*  
99. \*\*\*

When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure protection.

If recalled from a point less than one-half mile from rear of his train, he must, if safety to train requires, leave lighted fuses at proper intervals and, if conditions warrant, also place two torpedoes on the rail three rail-lengths apart.

\* \* \*

The front of the train must be protected in the same way, when necessary, by the brakeman; if not available, the fireman.

\* \* \*

#### AUTOMATIC BLOCK SYSTEM

505. Automatic block signals govern the use of the blocks, but unless otherwise provided, do not supersede the authority of trains; nor dispense with the use or the observance of other signals whenever and wherever they may be required.

509 (F). When an automatic block signal indicates "stop", train, after stopping, may proceed with caution, not exceeding twelve miles per hour, under the following conditions:

\* \* \*

(i) On double track.

509 (K). \* \* \*

\* \* \*

When proceeding under provisions of Rule \* \* \*, 509 (F) \* \* \*, speed must not exceed twelve miles per hour until rear of train has passed out of block, \* \* \*

#### AUTOMATIC TRAIN CONTROL

716. When passing a signal displaying any indication except "proceed", \* \* \* the engineer must operate the forestalling valve while passing over the track magnet.

Timetable special instructions read in part as follows:

RULE 827. TRAIN INSPECTION

Freight trains and light engines not equipped with tire coolers (except Mallets), on descending grade will stop between switches, as indicated, at following stations for inspection and heat radiation, \* \* \*

Eastward

Westward

\* \* \*

\* \* \*

Knapp ..... 5 mins.  
(for heat radiation)

\* \* \*

In the territory involved the maximum authorized speed was 20 miles per hour for freight trains and 30 miles per hour for light engines.

Description of Accident

Extra 4224 West, a west-bound freight train, consisting of engine 4224, 85 cars and a caboose, passed Emigrant Gap, 5.2 miles east of Blue Canon, the last open office, at 12:47 p. m. Because of flagging signals, this train stopped at 1 p. m., with the caboose standing 852 feet east of the station at Blue Canon. About 5 minutes later the rear end was struck by Extra 4249 West.

Extra 4249 West, without cars, departed from Norden, 25.5 miles east of Blue Canon, at 11:25 a. m., passed Emigrant Gap at 12:54 p. m., passed signals 1687 and 1677, and, at 1:05 p. m., while moving at an estimated speed of 25 miles per hour, it struck the rear end of Extra 4224 West.

Engine 4249 stopped upright on the track and was badly damaged. The cab was telescoped. The case containing the valve-pilot speed-recorder was broken, and that portion of the tape between the spools was missing. The caboose of Extra 4224 West, which was of all-steel construction, telescoped the cab of engine 4249, and was considerably damaged. The car immediately ahead of the caboose had one truck derailed, and its rear end was demolished.



Engine 4249 is of the articulated, single expansion, 4-8-8-2 type, and is equipped to burn oil as fuel. It is so designed that the cab is at the front end. The tender is at the rear end of the engine. The enginemen's view of the track ahead is unobstructed by any part of the engine. The total weight of engine 4249, in working order, is 1,051,200 pounds. This engine is provided with No. 8-ET brake equipment. An auxiliary emergency brake valve is located on the fireman's side of the cab. The regulating devices were adjusted for brake-pipe pressure of 80 pounds, and main-reservoir pressure of 110 pounds. The forestalling valve and the valve-pilot speed-recorder are located in the cab adjacent to the engineer's seat.

The engineer and the fireman of Extra 4249 West were killed.

The weather was clear at the time of the accident, which occurred at 1:05 p. m.

#### Discussion

Extra 4224 West passed Emigrant Gap at 12:47 p. m., passed signals 1687 and 1677, which indicated proceed, and stopped about 1 p. m. because of flagging signals of the flagman of a maintenance-of-way force. The caboose was 1,289 feet east of the east siding-switch at Knapp and 852 feet east of the station at Blue Canon.

Timetable special instructions require that all west-bound freight trains make a 5-minute stop at Knapp for wheel inspection and cooling of wheels. It is an established practice on this subdivision that when a train makes an unscheduled stop in the immediate vicinity of one of the regular inspection stops the crew proceeds with the inspection the same as if the inspection was being made at a regular stop. When Extra 4224 West stopped short of the usual inspection point at Knapp, the flagman immediately proceeded eastward from the caboose to provide protection. About 2 minutes later the engineer sounded the whistle signal to recall the flagman, and soon thereafter the engineer saw the flagman closely approaching the caboose. Then he attempted to release the brakes to proceed westward, but the collision occurred before the brakes were released.

The flagman said that when Extra 4224 West stopped at Knapp he proceeded eastward with flagging equipment until he was recalled by the engineer. He then placed two torpedoes on the rail and proceeded toward the caboose. As he approached the caboose he heard Extra 4249 West approaching, and the engine was working steam. He immediately started eastward and gave flagging signals to the approaching train. When he had reached a point approximately 500 feet east of his caboose the engineer of Extra 4249 West acknowledged his signals. When the engine passed the flagman, all of the driving wheels were sliding.

The conductor stated that he was in the caboose when Extra 4224 West stopped at Knapp, and that at the end of the 5-minute inspection period he went to the rear platform. He saw Extra 4249 West approaching about 500 feet distant at an excessive rate of speed, and heard the whistle of engine 4249 sounded when he alighted from the caboose just before the collision occurred.

After engine 4249 helped an east-bound freight train between Roseville and Norden, it was turned at Norden. This engine departed from Norden as Extra 4249 West. It passed Emigrant Gap 7 minutes after Extra 4224 West had passed that station, passed signals 1687 and 1677, which should have displayed restrictive aspects, and was moving at an estimated speed of 25 miles per hour when it struck the rear end of Extra 4224 West. The crew of Extra 4249 West consisted of the engineer and the fireman, and both were killed in the accident. The view of the point of accident from the cab of an approaching west-bound engine is restricted to about 500 feet by an embankment on the inside of the curve.

Examination of engine 4249 after the accident disclosed that the reverse lever and gear were in position for 60-percent cut-off in backward motion, the automatic brake-valve was in release position and the independent brake-valve was in lap position. The throttle lever was torn from its connections and it was impossible to determine its position immediately before the accident occurred. However, sufficient steam was admitted to the cylinders to move the engine backward about 250 feet after the brakes were released. The fireman's emergency valve was open. All of the driving-wheel tires, except the left No. 1 tire, had slid-flat spots ranging from 1 inch to 4-1/2 inches in length, and marks on the top of the rails indicated that the driving wheels had been sliding throughout a distance of 317 feet immediately east of the point of collision.

Tests of the automatic block-signal and automatic train-stop systems after the accident indicated that they were functioning properly. The enginemen of Extra 4209 West, which followed Extra 4249 West from Emigrant Gap and arrived at the scene of the accident a few minutes after the collision occurred, said that signals 1687 and 1677 were displaying proper restrictive aspects when their train passed them, and that the automatic train-stop system functioned as intended. About 5 inches of the tape from the valve-pilot speed-recorder, on which the movements of Extra 4249 West just prior to the accident were recorded, was so badly damaged that it was not legible. The legible portion showed that this engine had made several stops between Norden and Emigrant Gap. According to data furnished by the carrier the air-brake and automatic train-stop systems of engine 4249 were tested at 4:15 a. m., October 8, 1948, at Roseville enginehouse and functioned properly at that time.

Cause

It is found that this accident was caused by failure to operate the following train in accordance with signal indications.

Dated at Washington, D. C., this twentieth day of December, 1948.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.