INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE
LINE OF THE
SOUTHERN PACIFIC COMPANY

RENO, NEV.

NOVEMBER 19, 1938

INVESTIGATION NO. 2310

SUMMARY

Inv-2310

Railroad:	Southern Pacific
Date:	November 19, 1938
Location:	Reno, Nev.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	Extra 4165 West
Engine number:	4165
Consist:	85 empty refrigerator cars, caboose
Speed:	10-28 m.p.h.
Operation:	Timetable, train orders, automatic block-signal system
Track:	Double; level, then 0.84 percent ascending westward to and beyond point involved
Weather:	Clear
Time:	11:25 p.m.
Casualties:	5 injured
Cause:	Heavy run-in of slack due to sudden stop following a heavy service brake-pipe reduction.

Inv-2310

December 29, 1938.

To the Commission:

On November 19, 1938, there was a derailment of a freight train on the line of the Southern Pacific Company at Reno, Nev., which resulted in the injury of five employees.

Location and Method of Operation

This accident occurred on that part of the Sacramento Subdivision which extends between Sparks, Nev., and Sacramento, Calif., a distance of 156.6 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. The current of traffic is to the left. The accident occurred on the westward track as the train was passing the passenger station at Reno, located 3.3 miles west of Sparks.

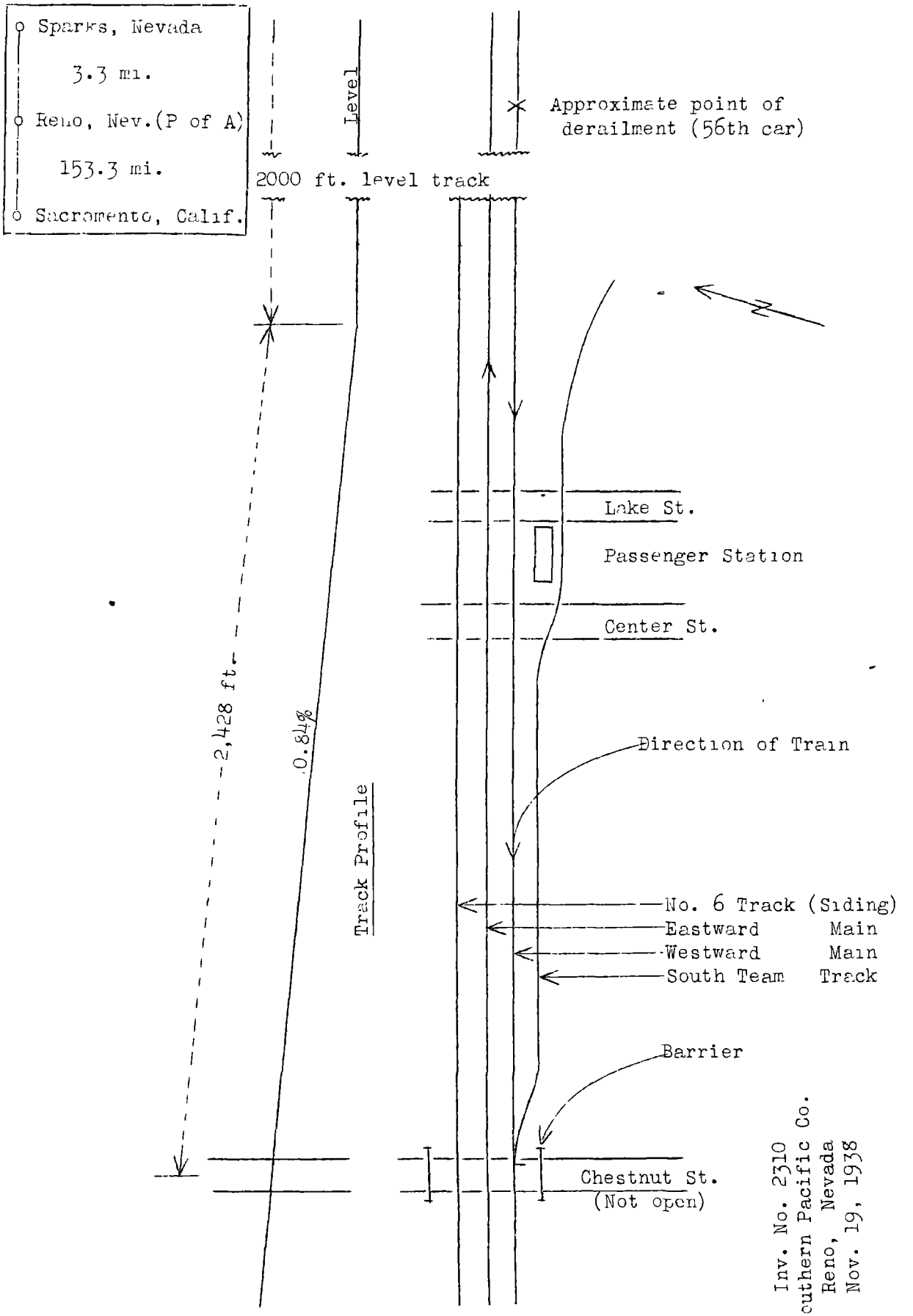
Chestnut Street extends practically north and south; it is located four city blocks or about 1,500 feet west of the station. Approaching Chestnut Street from the east the track is tangent more than 1 mile, and a considerable distance beyond. The grade westward is level a distance of more than 2,000 feet, then it is 0.84 percent ascending a distance of 2,428 feet to Chestnut Street and a distance of 522 feet west thereof. At Chestnut Street, a siding designated as No. 6 track parallels the main tracks on the north; a track extending eastward from Chestnut Street and designated as the south team track parallels the main tracks on the south, the switch leading thereto being located at Chestnut Street; this street is not open across the tracks, barriers being located along the property line on each side of the railroad. The space adjacent to the tracks in the vicinity of the barriers is used for public parking of automobiles.

The track structure consists of 100-pound rail, 39 feet in length, laid on an average of 22 creosoted ties to the rail length; it is fully tieplated, single-spiked, ballasted with about 8 inches of crushed stone and is well maintained.

The engine involved in this accident burns oil; the cab is at the front end and the tender is coupled to the rear.

The speed of trains is restricted to 30 miles per hour over various street crossings within the city limits of Reno.

The weather was clear at the time of the accident, which occurred at 11:25 p. m.



Inv. No. 2310
Southern Pacific Co.
Reno, Nevada
Nov. 19, 1938

Description

Extra 4165 West consisted of 85 empty refrigerator cars and a caboose, hauled by engine 4165, a 4-8-8-2 type with ET-6 brake equipment, and was in charge of Conductor Geoble and Engineman Van Slyke. This train left Sparks at 11:15 p.m., according to the train sheet, proceeded through Reno and while the train was traveling at a speed variously estimated to have been from 10 to 28 miles per hour with the forward portion approaching Chestnut Street and on an ascending grade, the engineman made a heavy service reduction of the brake-pipe pressure to avoid striking an automobile which was fouling the track in the parking area near the barrier at Chestnut Street, resulting in the train stopping suddenly after moving approximately 300 feet. The automobile was backed away from the track by its driver just in time to avoid being struck.

The caboose and six cars in the train, namely, the sixth, sixty-fifth, sixty-ninth, seventy-eighth, eightieth, and eighty-fourth cars were damaged. One pair of wheels on the fifty-sixth car was derailed and a slip-over of couplers occurred between the seventieth and seventy-first cars, which separated about 18 inches, both knuckles remaining closed and the air hose connected. The truck bolsters on the B-ends of the sixty-fifth, sixty-ninth and eightieth cars, and the cast steel truck bolsters on the A-end and B-end of the eighty-fourth car were broken. The caboose was considerably damaged and its furnishings were knocked loose and broken. The employees injured were the conductor and four brakemen, who were in the caboose.

Summary of evidence

Engineman Van Slyke stated that a terminal test of the air brakes was made before departure from Sparks and they were in proper working order; the leakage was about 2½ pounds. The brake-pipe pressure carried was 80 pounds, the standard for freight trains on this road. The control delay valve was set as required for freight service before departure and it remained in that position en route. When the valve is in freight position the build-up of emergency brake cylinder pressure is slower than when set for passenger service. The train departed from Sparks and a speed of about 18 miles per hour was attained. Approaching Reno he eased off to a drifting throttle, sounded the proper engine whistle signals and, after passing over the principal street crossings within the city limits, opened the throttle to some extent and started up the grade. The speed was about 12 or 15 miles per hour at this time and the headlight on the engine was burning properly. When reaching a point about four car lengths from the parked automobiles he saw that it was fouling the main track in the parking area near the south barrier at Chestnut Street. In accordance with the rules he did not change the position of the

throttle and made a brake-pipe reduction of about 20 pounds; an undesired emergency application of the brakes took effect and the train stopped after moving about six car lengths, the back end of the tender being opposite the automobile. He did not close the throttle until after the train stopped. He stated that the driver of the automobile backed it away from the track just in time to avoid being struck, and the engineman thought that it would have been struck if the air brakes had not been applied. There were many automobiles with headlights burning parked on both sides of the tracks near the barriers at Chestnut Street, but the headlights of the automobile involved were not burning. He said everything happened quickly, but that he applied the air brakes and there was a heavy exhaust which ceased when an undesired emergency application of the brakes took place. He was positive that he did not make an emergency application but that the brakes somewhere on the rear of the train went into emergency; the air gauge indicated this and there was a heavy run-in of slack. This was the only brake application made between Sparks and the point of accident. He could not advance any reason for the cause of the unusual stop. The engine and train handled well en route, and no shock was felt on the engine when the stop occurred. Occasionally an undesired emergency takes place, but he had never previously experienced one where such a severe shock occurred. As far as he knew there was no defective condition about the engine, train or air brake equipment. In his opinion, the slack on the entire train was stretched when the undesired emergency application occurred, as the engine was working steam, the forward portion of the train was on the ascending grade and the rear portion on level track. After stopping he recharged the air-brake system to 80 pounds brake-pipe pressure and moved ahead about 15 feet or a little more, until all the slack was taken; he then slacked back but was able to move only about 20 feet.

Fireman Crowder and Head Brakeman Hathaway gave testimony similar to that of Engineman Van Slyke as to the speed of the train, and the operation of the engine including the manipulation of the brake valve and the throttle. The fireman said that a service air-brake reduction was made and an undesired emergency application occurred but the head brakeman did not know whether a service or an emergency application was made. There was no shock felt on the engine and they could not advance any reason why the shock of the stop on the rear portion of the train was so severe. The brakeman went back and looked the train over and reaching a point about 35 or 40 car lengths back of the engine he found some brakes sticking and pistons out; he released the air from 4 or 5 cars and found no separation in the train between the engine and this point.

Conductor Geoble, who was interrogated at a hospital, said that the speed of his train was about 10 or 12 miles per hour, and that the five men in the caboose were not aware of anything wrong until the caboose made a sudden stop with a severe shock,

just as though it went against a wall. He had previously experienced slack run-ins but never anything to equal this stop, saying that ordinarily at least two shocks take place when a slack run-in occurs, but on this occasion he felt just one severe shock. The air pipe under the caboose was broken by the impact, and after the stop he could hear the air escaping. He further stated that as far as the stop was concerned the slack must have run in the full length of the train. He thought the slip-over of couplers between the seventieth and seventy-first cars must have occurred when the severe impact took place, causing the closed knuckles to jump out. After the train stopped he could hear the sound caused by attempts to start the train ahead; the caboose was not moved in these attempts.

Brakeman Woolverton was in the caboose. He estimated the speed at 12 to 15 miles per hour. He did not feel any run-in of slack.

The other three injured brakemen were not available for questioning.

General Yardmaster Swierski was in his automobile on a street near the tracks one city block east of Chestnut Street when Extra 4165 passed. He estimated the speed of the train at that time to have been between 25 and 28 miles per hour and shortly thereafter the train made a sudden stop. He proceeded to the engine to find out what was wrong. The engineman took slack several times in an attempt to start ahead. Inspecting the train the general yardmaster observed by aid of the reflection from automobile headlights that the slack was stretched on about the first 30 cars but did not observe the slack from that point to the caboose. When a yard engine arrived it was coupled to the caboose and the air was cut in. The brakes remained applied on the cars. It was then found that the brake pipe was broken at the branch pipe on the caboose, and it was necessary to release the air from the cars and move them away without operative air brakes. He further stated that toward the rear end of the train coupler lock blocks were up, but he could not say definitely on which cars; the indications were that a run-in of slack had occurred.

Yard Engine Foreman Hawkins corroborated the statement of the general yardmaster with respect to the broken brake pipe on the caboose. When going forward he found that the train was parted about 18 inches between the seventieth and seventy-first cars; both knuckles were closed where the train had parted, but the air hose were still coupled. A knuckle was then opened and the cars were recoupled. The air was then released from the cars to the point where the derailed car was located, this being the fifty-sixth car.

Assistant Superintendent Bray stated that engine 4165 had ET-8 brake equipment, embracing a number of features, including synchronization of locomotive with train brake both in service and emergency. In service the locomotive brakes and the train brakes apply uniformly on both a time and pressure basis. This is accomplished through the medium of a reduction reservoir, which delays the beginning of effective brake-cylinder pressure development on the locomotive to coincide with that on the cars, after which both car and locomotive cylinder pressures build up uniformly. In emergency applications the brake equipment is adjusted to provide slack control according to the service. This feature provides a rapid development of locomotive brake-cylinder pressure for passenger and short freight trains and a controlled build-up for long freight trains. Another feature is the brake-pipe service reduction automatically controlled on long trains. The automatic brake valve has a first service position for use on long trains with maximum permissible leakage. This position provides an initial normal service rate of brake-pipe reduction sufficient to initiate quick service on the train brakes, after which a slower rate is imposed, allowing the brake-pipe pressure to adjust itself throughout the train and avoid a heavy reduction at the front end. A maintaining type of equalizing piston is employed to assure that this imposed rate is not exceeded. The engineman, therefore, is able to gather the slack gently by using this position, avoiding a heavy head-end brake application and resultant severe run-in of slack.

Road Foreman of Engines Keenan stated that the engineman involved apparently handled the locomotive in accordance with the requirements for making a surprise stop. He thought the unusually rough stop was caused by a heavy service reduction, increasing the brake-cylinder pressure on the head portion of the train with the slack entirely out on the 85 empty cars. The damage and slack action probably would have been minimized had the engineman made an emergency application instead of a service application, because the brakes would apply in emergency much more rapidly throughout the train. When the slack is stretched in the train more damage and shock usually occur from a service application than from an emergency application. There are locations on the road where slack action must adjust itself; an engineman must use his own judgment and manipulate the air to adjust the slack to go through dips and over humps. Moving at a speed of 15 to 18 miles per hour and making a continuous service reduction a heavier shock would occur on the rear end than from an emergency application. With the present standard of air-brake maintenance, undesired emergency applications often occur after brake-pipe reduction has been started on the engine.

According to a switch list of the train involved submitted by officials, only 9 cars in the train of the 85 cars and caboose were equipped with the "AB" type brakes; these were the thirteenth, thirty-sixth, forty-sixth, fifty-second, fifty-ninth, sixty-eighth, seventieth and seventy-second cars.

Discussion

Before departure from Sparks a terminal test of the air brakes on Extra 4165 West was made and they functioned properly. The control delay valve was set as required for freight service so that brake cylinder pressure on the engine and tender would not increase at as high a rate as on the cars. After passing over the principal street crossings of Reno, the engineman opened the throttle to some extent. The forward portion of the train was on the 0.84 percent ascending grade, the rear portion was on level track, with the slack stretched in the train of 85 empty cars, and the speed approaching Chestnut Street was variously estimated to have been between 10 and 28 miles per hour. When about four car lengths distant, the engineman saw an automobile standing afoul the track in the space adjacent to the south barrier at Chestnut Street. He immediately made a heavy service brake-pipe reduction, the first reduction made on the trip. The testimony was to the effect that the automobile would probably have been struck by the engine, had the engineman not made an air-brake application. The train stopped within a distance of about six car lengths. The engineman did not close the throttle until after the train had stopped.

From the resultant damage it appears that there was a heavy run-in of slack. Six cars and the caboose were damaged; truck bolsters were broken on four cars, one car was derailed and a slip-over of couplers occurred between the seventieth and seventy-first cars, these cars being separated about 18 inches but the air hose remained connected and the knuckles closed.

According to the evidence members of the crew who were on the caboose felt only one shock at the time of the accident; ordinarily at least two shocks occur when there is a run-in of slack. However, the conductor was of the opinion that there must have been a run-in of slack the full length of the train. No shock was felt on the engine; nevertheless the engineman thought there had been a heavy run-in of slack. The engineman said that he made a service reduction of about 20 pounds but thought the brakes somewhere on the rear of the train had gone into emergency. However, the road foreman of engines thought the unusually rough stop was caused by a heavy service reduction and said that the engineman apparently made the reduction in accordance with the rules but that had he made an emergency application instead of a heavy service application probably the slack action and damage would have been much less because the brakes would apply much more rapidly throughout the train. Only nine cars in the train of 85 empty cars and caboose distributed between the thirteenth and seventy-second cars, inclusive, were equipped with the "AB" type brake. The question of serial action with older types of air brakes was discussed in the report of this Bureau of the accident on the Western Maryland Railway at Oldtown, Md., on Febru-

ary 9, 1937. In that accident only one car in a train of 162 empty cars and a caboose was equipped with an "AB" type air brake and coupler slip-overs occurred at two points. In that report, the following statement was made:

> "Only one car in the train involved was equipped with an "AB" type air brake. The action of the air brake on both occasions illustrates the fact that under such conditions the serial action with older types of air brakes is not fast enough, on freight trains of considerable length, to prevent destructive slack action when an emergency application takes place. This accident emphasizes the urgent need for improved brakes and points to the necessity for expediting the progressive change to the new "AB" type of brake on freight cars."

Conclusions

This accident was caused by a heavy run-in of slack due to a sudden stop following a heavy service brake-pipe reduction.

Respectfully submitted,

W. J. PATTERSON,

Director.