

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE  
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE  
LINE OF THE SOUTHERN PACIFIC COMPANY NEAR DOME,  
ARIZ., ON AUGUST 5, 1931.

September 23, 1931.

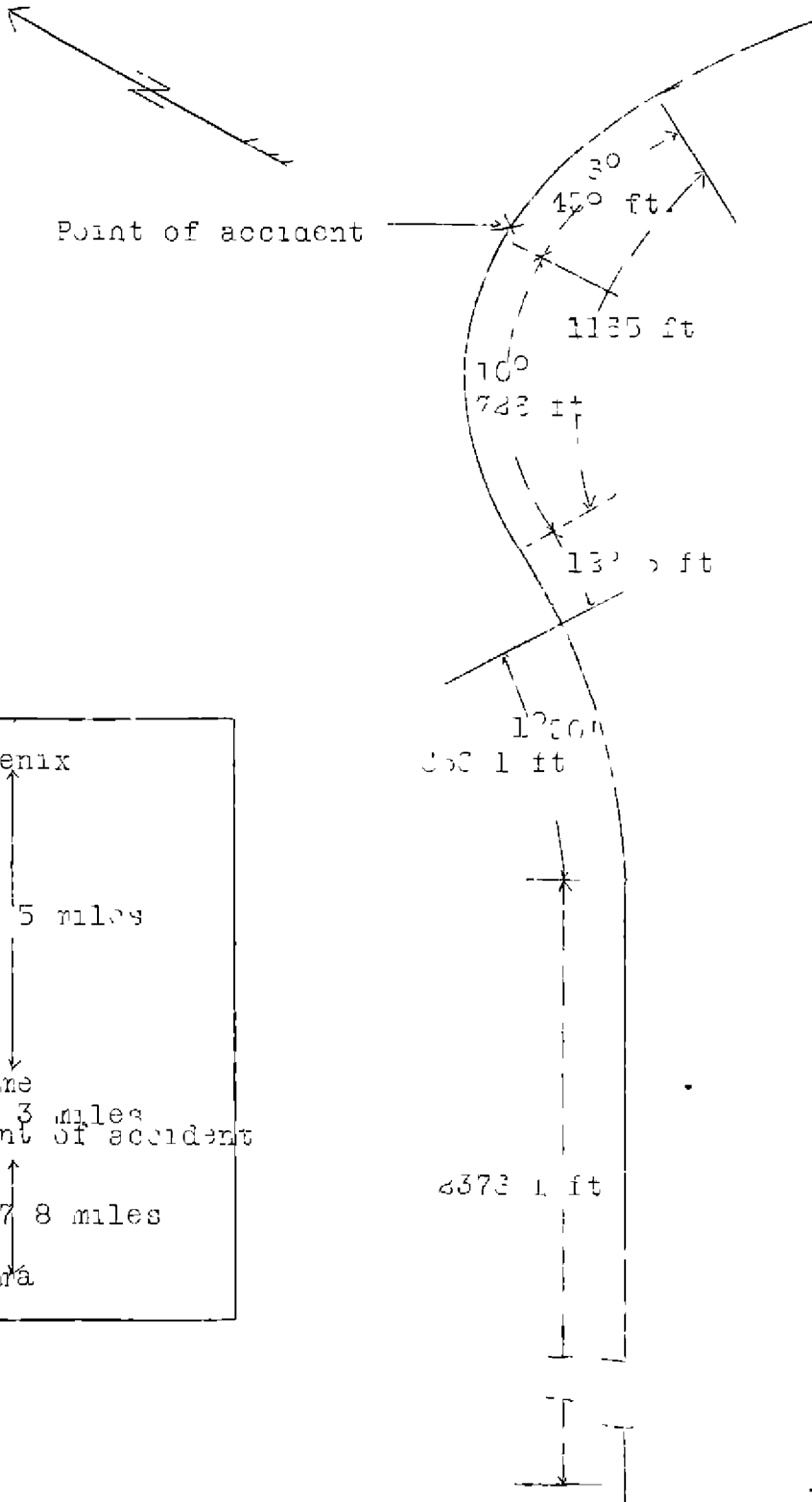
To the Commission:

On August 5, 1931, there was a derailment of a passenger train on the line of the Southern Pacific Company near Dome, Ariz., which resulted in the death of 2 employees, and the injury of 12 passengers and 5 trespassers.

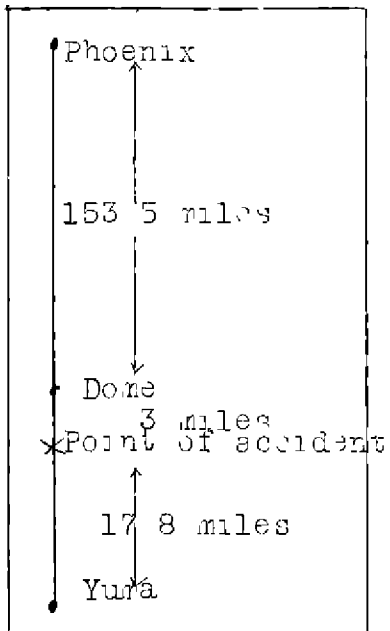
Location and method of operation

This accident occurred on the Wellton Subdivision of the Tucson Division, which extends between Yuma and Phoenix, Ariz., a distance of 173.3 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The accident occurred near mile post 750, at a point approximately 3 miles west of Dome. Approaching this point from the west, the track is tangent for a distance of 2,376.1 feet, followed by a  $1^{\circ} 30'$  curve to the left 656.1 feet in length, tangent track for a distance of 122.5 feet, and then a compound curve to the right 1,165 feet in length; this latter curve consisted of 270 feet of spiral, a  $10^{\circ}$  curve 456 feet in length, and then a  $6^{\circ}$  curve for a distance of 289 feet, followed by 150 feet of spiral; the accident occurred on the  $6^{\circ}$  curve at a point 15 feet from its western end. The grade for eastbound trains is slightly ascending, being 0.04 per cent at the point of accident. On account of the rugged and mountainous country and the numerous sharp curves located on this section, the maximum speed for all trains in this vicinity is 30 miles per hour; the slow board at the western end of this restricted territory is located at a point 2.54 miles west of the point of accident.

In the vicinity of the point of accident the track is on a fill 20 feet in height; it is laid with 130-pound rails, 39 feet in length, with 22 or 23 creosoted



Point of accident



Inv No 1718  
 Southern Pacific Co ,  
 Done, Arizona  
 August 5, 1931

fir and gum ties to the rail-length, fully tie-plated, double-spiked, and ballasted with crushed rock to a depth of 8 inches. The track is maintained in excellent condition.

It was raining at the time of the accident, which occurred about 2 30 a. m.

#### Description

Eastbound passenger train first No. 104 consisted of two baggage cars and one coach, hauled by engine 3122, and was in charge of Conductor Burkitt and Engineman Steyaert. The baggage cars were of steel construction and the coach was of wooden construction. This train departed from Yuma at 1.55 a. m., according to the train sheet, 15 minutes late, entered the siding at Fortuna, 9.8 miles west of Dome, at 2.18 a. m., to meet train No. 11 and was approaching Dome when it was derailed while traveling at a speed estimated by a surviving member of the train crew to have been 30 miles per hour.

Engine 3122 was derailed to the left or outside of the curve and stopped on its left side down an embankment with its head end 200 feet beyond the initial point of derailment and 56 feet from the outside rail, and the rear end 73 feet from the outside rail; it was badly-damaged, with all the appurtenances torn off from the top as well as the left side of the engine. The tender also stopped on its left side behind the engine, the draw bar between the engine and tender having been broken. The first car was headed down the embankment, but remained in an upright position; the second car stopped on its right side to the right of the track, and the last car stopped, leaning to the right at an angle of 45° against the side of the cut. The engine truck remained astride the north or high rail, stopping at a point 297 feet beyond the point of derailment. The employees killed were the engineman and fireman.

#### Summary of evidence

Conductor Burkitt stated that the air brakes were tested before departure of the train from Yuma and functioned properly when the stop was made to take siding at Fortuna. After train No. 11 passed, at 2.18 a. m., train first No. 104 departed eastbound, the brakeman lining the switch and catching the rear end of the train without stopping it, and Conductor Burkitt + + + + +

it did not take much more than a minute to pull out of the siding. He was busy taking up tickets and making out a consist after leaving Fortuna, being so engaged practically up to the time of the derailment, and he could not state definitely whether the air brakes had been applied at any time after leaving Fortuna. He went to the rear platform of the coach on two occasions, a short time after leaving Fortuna and again just before the train reached the restricted speed territory in which the accident occurred, and he estimated the speed at that time to have been about 50 miles per hour. The first intimation he had of anything wrong was when the coach quivered, and it rolled over before he could entirely get up from his seat. He had noticed nothing unusual in the operation of the train at any time and did not think that the speed limit had been exceeded, stating that the speed was about 50 miles per hour at the time of the accident. Conductor Burkitt said the engineman appeared to be in normal condition on the day of the accident.

The statements of Brakeman Birks, who was also riding in the last car, practically corroborated those of Conductor Burkitt. He added that the train might have been traveling at a speed of 60 miles per hour between Fortuna and the restricted territory in which the accident occurred, and he had no recollection of the brakes having been applied until the engine reached the western end of the compound curve; this application was followed about 8 or 10 seconds later by a release, and then the car tipped over. He did not, however, think that the speed was excessive at the time of the accident. Brakeman Birks went back to flag after the occurrence of the accident, and on the following day he examined the engine and cars but found nothing that would have contributed to the cause of the derailment.

Engineman Flood, who was deadheading on train first No. 104 on the day of the accident, stated that he was asleep most of the time from Yuma to the time of the derailment, although as the train reached the first sharp curve in the restricted territory the speed was such that it awakened him enough for him to notice that the train was traveling too fast and he said he hoped that it would not hit the next curve quite so hard; had he awakened completely, he would have called the conductor's attention to it. An application of the air brakes was made as they rounded the first curve in the restricted territory, too late to be effective for that

particular curve, and he did not notice any application being made for the curve on which the accident occurred. Engineman Flood further stated that after looking over the wreckage and the track he came to the conclusion that the accident was due to excessive speed.

Section Foreman Nieto, on whose section the accident occurred, stated that upon his arrival at the scene of the accident about two and one-half hours after its occurrence he made a cursory examination of the track looking for broken rails or a washout, there having been some rain, but found nothing wrong. Later he made a more careful examination of the track and found marks where the engine had climbed the rail and also flange marks on an outside angle bar, on ends of ties and leading down the bank. He walked westward a distance of about 3 miles but saw no indication of a washout nor anything that might have fallen from the engine. Section Foreman Nieto stated that the last work performed on this curve was about six months previously, this work consisting of surfacing the track; the track is patrolled about once a week and a trackwalker had been over it on the day previous to the occurrence of the accident. He was of the opinion that the accident was caused by excessive speed and possibly that the air brakes had been applied too quickly causing the engine to rock.

Roadmaster Murphy stated that he arrived at the scene of the accident about three hours after its occurrence and made a careful inspection of the track, walking westward about 1/2 mile but finding nothing on the track which could have dropped from the engine. The track was in good shape, with no evidence of soft spots, or loose bolts or spikes. Measurements of the gage showed it to vary from 4 feet 8 5/8 inches to 4 feet 9 inches, and the elevation was from 4 1/8 inches to 4 3/8 inches. He found marks on the outside of the north rail on an angle bar and bolt, and also on the ties, indicating the initial point of derailment, there were no marks on the rail at this point. Roadmaster Murphy stated that his examination of the engine and equipment disclosed nothing that could have contributed to the cause of the derailment, and it was his opinion that the derailment was caused by excessive speed.

Engine Inspector Lorona stated that he inspected engine 3122 on the morning of August 2 at Yuma;

it had arrived there that morning and did not go out again until its departure on the day of the accident. He found nothing wrong with the running gear and on making a test of the air-brake equipment, he found all parts to be functioning properly, and there were no loose unions or leaks. Certain repairs to other parts were needed and reported by him, and Roundhouse Foreman Moran stated that these repairs were made before the departure of train first No. 104 on the day of the accident.

Car Inspector De Grande stated that he inspected and tested the brakes on train first No. 104 before its departure from Yuma and found them to be working properly. The piston travel was not excessive, the brake shoes and levers were in good condition, and he found no defects on these cars that would have contributed to the cause of the derailment.

Road Foreman of Engines Graydon stated that he thought Engineman Steyaert was a qualified passenger engineman at the time the Arizona Eastern Railroad was taken over by the Southern Pacific Company; he did not know whether or not the engineman had made student trips in passenger service, but said he had made such trips in freight service. He had made an effort to ride with Engineman Steyaert on several occasions but had not been able to do so. Engineman Steyaert had not worked on the main line until January, 1931, shortly after that time he was in freight service between Yuma and Phoenix. Road Foreman of Engines Graydon stated that experience had taught him that after operating in freight service with a low-wheel engine, an engine with 57-inch driving wheels, and then operating an engine with high wheels of 73 inches diameter, as was the case with engine 3122, with only three cars, an engineman is apt to make a mistake in his judgment of speed. It appeared to him that Engineman Steyaert in approaching the first restricted-speed curve, about 2 miles west of the point of derailment, operated the train at an excessive rate of speed and that after rounding that curve and not being familiar with the engine, he worked too heavy a throttle on the tangent track and then on the curve on which the accident occurred, allowing the speed to pick up considerably in excess of the maximum permissible speed, and it was his idea that the engineman then realized the conditions and applied the brakes, which had a tendency to make the engine truck rigid and caused the engine to rise off the engine

truck. He thought that the speed was probably 45 or 48 miles per hour at the time of the accident.

The first mark of derailment was found on the bolt heads on the outside of a rail joint on the high or outside rail at a point 15 feet east of the leaving end of the 10° curve. Flange marks also were found on the ends of the ties, leading down the embankment. There were no marks of any kind at the point of derailment on the low or south rail, or between the rails.

Engine 3122 is of the 4-6-2 type, with a driving-wheel base of 13 feet and a total wheel base of 74 feet 9 inches. It had been stopped for engine-truck repairs and turning engine-truck and trailer-truck wheels on July 27, 1931, and since that time its approximate mileage was 841 miles.

#### Conclusions

This accident was caused by excessive speed on a sharp curve.

Brakemen Birks stated that before reaching the restricted-speed territory the train was traveling at a speed of 30 miles per hour and Conductor Burkitt estimated the speed at 30 miles per hour. The west end of the restricted territory, providing for a maximum speed of 30 miles per hour, was about 2.3 miles west of the curve on which the accident occurred. While neither of them was able to state that the brakes had been applied on passing through this territory until just prior to the derailment, they did not think that the speed was excessive at the time of the accident. A thorough examination of the track and equipment, however, disclosed nothing that could have contributed to the cause of the accident. The only marks found on the track at the point of derailment were on the outside angle-bar bolts on the high rail, and on the ends of the ties leading down the embankment, indicating that the engine turned over from centrifugal force without first being derailed. This could be accounted for only by excessive speed, which is consistent with the position in which the wreckage came to rest, and with the fact that the engine apparently landed on its back and then turned on its left side before coming to a stop down the embankment.

Engineman Stevaert was employed on the Arizona Eastern Railroad when it was taken over by the Southern Pacific Company. Since June, 1931, he had made 17 trips between Yuma and Phoenix within which territory this accident occurred; 11 of these trips were in freight service and 6 were in passenger service and it is believed this should have been sufficient to enable him to become familiar with the physical characteristics. Conductor Burkitt did not appear to have been paying proper attention to the operation of his train. Judging from the statements of the engineman who was deadheading, there were sufficient indications that the train was not being operated at a safe rate of speed, and it was incumbent on Conductor Burkitt to take proper steps to correct this situation before an accident occurred.

All of the employees involved were experienced men and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. F. BORLAND,

Director.