

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE ATCHISON, TOPEKA & SANTA FE RAILWAY NEAR HOT SPRINGS JUNCTION, ARIZ., ON SEPTEMBER 20, 1923.

November 27, 1923.

To the Commission:

On September 20, 1923, there was a derailment of a passenger train on the Atchison, Topeka & Santa Fe Railway near Hot Springs Junction, Ariz., which resulted in the death of 2 persons carried under contract and 2 employees, and the injury of 56 passengers, 10 persons carried under contract, and 5 Pullman employees. The investigation of this accident was made in conjunction with representatives of the State Corporation Commission of Arizona.

#### Location and method of operation.

This accident occurred on the Fourth District of the Albuquerque Division, extending between Ash Fork and Phoenix, Ariz., a distance of 184 miles; this is a single-track line over which trains are operated by time-table and train orders, no block-signal system being in use. The point of accident was about  $1\frac{1}{4}$  miles north of Hot Springs Junction; approaching this point from the south the track is tangent for a distance of about 3,700 feet, followed by a curve of  $6^{\circ}$  to the left 154 feet in length, 2,080 feet of tangent, and a curve of  $9^{\circ} 54'$  to the right 533 feet in length, the first indication of anything wrong being visible on this last-mentioned curve at a point 62 feet from its southern end. The grade for northbound trains is either level or descending for a distance of more than  $1\frac{1}{2}$  miles, the maximum being 1.06 per cent at the point of accident. The track is laid with 85-pound rails, with an average of 28 ties to the rail-length, single-spiked, tie-plated on all curves, and ballasted with sand and gravel, it was maintained in good condition. With an engine of the type involved the maximum speed permitted is 50 miles an hour. The rules do not provide for the furnishing of pilots on detoured trains. The weather was clear at the time of the accident, which occurred at about 1.30 p. m.

#### Description.

Northbound passenger train extra 1258, ordinarily operated as train No. 3 over the main line of the Atchison, Topeka & Santa Fe Railway between Chicago, Ill., and Los Angeles, Calif., reached Phoenix after having been detoured from Albuquerque via Denning, N. M., and Maricopa, Ariz., on

account of washouts. It consisted of 1 buffet car, 2 baggage cars, 1 buffet car, 1 dining car, and 5 Pullman sleeping cars, in the order named, hauled by engine 1258, and was in charge of Conductor Goodroe and Engineman Timm. The cars were of all-steel construction with the exception of the first-car, a leadhead car, which had a steel-underframe. This train left Phoenix, 43.5 miles south of Hot Springs Junction, at 12.30 p.m., according to the train sheet, made a stop for water at Agua Fria, 18.7 miles north of Phoenix, which consumed between 5 and 10 minutes, passed Hot Springs Junction at 1.42 p.m., and after having proceeded about  $1\frac{1}{4}$  miles farther was derailed while traveling at a speed variously estimated at between 30 and 60 miles an hour.

Engine 1258 and the first five cars were derailed to the left, the engine coming to rest on its left side quite badly damaged, with its head end 268 feet from the initial point of derailment. The first car came to rest beyond the engine and was demolished while the second car was bottom up with one end resting on the engine, the next three cars remained upright. The employees killed were the engineman and fireman.

#### Summary of evidence.

On account of washouts on the main line, transcontinental trains in each direction were being detoured, and on the night of September 18 Engineman Timm and Fireman Tuttle were on eastbound train No. 4 from Barstow, Calif., to Parker, Ariz., a distance of 183.5 miles, arriving at Parker at 1.30 a.m., September 19. They were called for duty at 1 p.m., on the same day, and left Parker on engine 1258, which was the second engine on train No. 234, en route from Parker to Wickenburg, a distance of 110.6 miles, reaching Wickenburg at 7.20 p.m. Engines 1264 and 1258, coupled, were then run light from Wickenburg to Phoenix, a distance of 54.2 miles for the purpose of meeting detoured trains, and arrived at Phoenix at 10.20 p.m. On this portion of the trip, Road Foreman of Engines Walker relieved Engineman Renard, of engine 1264, the lead engine, and personally operated the engine, Engineman Timm and Fireman Tuttle being on engine 1258. Conductor Goodroe, Head Brakeman Post and Flagman Carter, the members of the train crew of extra 1258 at the time of the accident, deadheaded from Parker to Phoenix on a local freight train, reaching Phoenix at 10.25 p.m. This was the first trip any of the members of the crew of extra 1258 had made over the territory between Wickenburg and Phoenix, within which territory the accident occurred, and it is to be noted that it was made after dark.

The next morning Road Foreman of Engines Walker asked members of the crew of the first train that was ready, this being the train ahead of the one involved in the accident and hauled by engine 1264, as to whether or not they had a pilot for the northbound trip. On being informed that they did not, he hauled the train in this capacity from Phoenix to Matthe, which station is 10.7 miles north of Hot Springs Junction, and then informed the engineman of the conditions beyond this point. Road Foreman of Engines Walker said he noticed nothing unusual with the condition of the track in the vicinity of the point of accident; also, that it was his intention to return to Wickenburg, 4.7 miles south of Matthe, accompany Engineman Timm to Matthe, and also impart information to him relative to conditions beyond this point.

Extra 1258 left Phoenix less than one hour after extra 1264, according to the train sheet, without a pilot, although there were several employees available at this point who could have acted in this capacity. Conductor Goodroe estimated the speed of extra 1258 to have been 30 miles an hour passing Hot Springs Junction, while Head Brakeman Post thought it was 50 miles an hour at this point. On reaching the first curve south of the curve on which the accident occurred, there being a tangent of 2,080 feet separating these two curves, Conductor Goodroe felt the train lurch, owing to the speed, which was then 50 miles an hour, however, an air brake application was made to steady the train, and he said this application had not been released at the time of the derailment, estimating the speed at this time to have been 35 miles an hour. Head Brakeman Post estimated the speed to have been about 50 miles an hour when the brakes were applied on the first curve, and less than 40 miles an hour at the time of the derailment. Conductor Goodroe expressed no opinion as to the cause of the accident, while Head Brakeman Post was of the opinion that it was caused by the track being out of alignment. The statements of the flagman brought out no additional information. Road Foreman of Engines Walker attributed the accident to excessive speed, and said he had operated engines around this particular curve on numerous occasions at 35 miles an hour. The air brakes on extra 1258 were tested at Phoenix, and a running test made leaving that point, both of which tests showed them to be working properly.

Conductor Goodroe further stated that while at Phoenix he read bulletins and conferred with Assistant Superintendent Hunt as to the physical characteristics of the road between Phoenix and Wickenburg, and just before leaving Phoenix was advised to take water at Agua Fria, which information he imparted to Engineman Timm, no further conversation being had with the engineman relative to this trip, he stated he did not make a request for a pilot, and did not know whether Engineman Timm had done so.

Assistant Superintendent Hunt stated that during the morning of the day of the accident he talked with Conductor Goodroe as to the physical characteristics of the road between Phoenix and Wickenburg, and informed him there were no heavy grades but numerous curves, however, he did not talk with Engineman Timm. He said neither of these employees requested him to furnish them a pilot, and furthermore he did not think a pilot necessary; he was of the opinion the accident was caused by excessive speed.

Operator Sylvester, on duty at Phoenix at the time of the accident, stated that neither Conductor Goodroe nor Engineman Timm asked for a pilot. The operator also said he inquired of the chief dispatcher as to furnishing pilots, before either train departed, and was informed that pilots were not to be furnished.

Inspection disclosed that the track was moved out of alignment for a distance of 11 feet, beginning at a point 62 feet north of the south end of the curve, reaching its maximum, 1 inch, at a point 23 feet farther north; this movement, however, apparently was not the cause of the derailment. The first mark of derailment was a clearly defined flange mark on the ball of the left, or high rail, at a point 7 feet north of where the track was moved out of alignment, and the first mark on the ties was on the outside of the left rail, 3 feet 7 inches beyond the flange mark on the rail. There were no flange marks on or near the right rail. Starting at a point 16 feet 9 inches north of the first flange mark, the track was torn up for a distance of 294 feet. Measurements of the gauge and elevation for some distance south of the point of derailment failed to disclose any material difference, but on the whole showed the track to be in good condition, and it is not believed that it was in anyway involved in the cause of the accident.

Engine 1258 is of the 4-6-2 type, having a total weight, engine and tender loaded, of 405,700 pounds; and a driving-wheel base of 13 feet 8 inches, it last received heavy repairs at the San Bernardino shops on July 31, 1923. A thorough examination of this engine subsequent to the accident failed to disclose any defects which could have contributed to the occurrence of the accident.

Conclusions.

This accident was caused by excessive speed.

All the evidence indicates that the speed of the train was high at the time of the accident, and apparently the engine rounded the curve at such a speed as to cause the track to shift and finally to result in a wheel or wheels climbing the outside rail. There is a cut on the north end of the tangent a few hundred feet south of the curve which interferes with the clear view of the curve by the engineman of a northbound train until he has nearly reached it, while there is no slow board to indicate the speed at which trains should be operated around the curve. Although they were unfamiliar with the conditions existing at this point, or at any other point in this territory, it appears that neither the conductor or engineman asked that a pilot be furnished, that Assistant Superintendent Hunt did not consider a pilot to be necessary, and that the dispatcher said pilots were not to be furnished. There is no apparent reason why either of these two officials could not have arranged for pilots had it been desired to furnish them, for there were experienced employees available who could have acted in that capacity. While Engineman Timm may be open to censure for operating his train at such a rate of speed over territory with which he was entirely unfamiliar, these officials were generally in charge, the assistant superintendent even having gone to Phoenix for the particular purpose of keeping in close touch with the situation created by the detouring of so many trains, and they are at fault for their failure to have a pilot furnished for this train.

At the time of the accident none of the employees involved had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. BORLAND,

Director.