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 DOMINGO, N. M., ON JULY 3, 1923.

September 10, 1923.

To the Commission:

On July 3, 1923, there was a derailment of a passenger train on the Atchison, Topeka & Santa Fe Railway near Domingo, N. M., resulting in the death of 4 employees, and the injury of 45 passengers, 1 mail clerk, and 1 employe

Location and method of operation.

This accident occurred on that part of the Third District of the New Mexico Division extending between Lamy and Albuquerque, N. M., a distance of 67.2 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 at a point 10,277 feet west of the station at Domingo; approaching this point from the east the track is composed of numerous short curves and tangents, followed by a tangent 1,024 feet in length, then a curve of 8° 30' to the left 758 feet in length, the accident occurring on this curve at a point 202 feet from its western end. The grade around the curve on which the accident occurred is level, however, for more than a mile east of this point it is descending for westbound trains, varying from 0.26 to 0.5 per cent. The track is laid with 90-pound rails, 33 feet in length, single-spiked, with about 19 treated pine ties to the rail-length, tie-plated, and ballasted with gravel about 12 inches in depth; four-bolt angle bars and anti-rail creepers are also used. The track is well maintained. No speed restrictions are placed on curves, except in special or emergency cases, when slow boards are used. The weather was cloudy at the time of the accident, which occurred at about 11.51 p.m.

Description.

Westbound passenger train No. 9 consisted of one baggage car, one mail car, one combination baggage and mail car, two baggage cars, two coaches, one chair car, three tourist sleeping cars, and three Pullman sleeping cars, in the order named, hauled by engines 1351 and 3715, and was in charge of Conductor Eastman and Enginemen Blevins and Roberts. This train left Lamy, 30.1 miles from Domingo, at 11.07 p.m., 27 minutes late, passed Domingo at 11.49 p.m., 21 minutes late, and after having proceeded almost 2 miles farther was derailed while traveling at a speed estimated to have been between 40 and 60 miles an hour.

Both engines and the second, third, fourth, fifth and sixth cars were derailed to the right, and came to rest clear of the roadbed, engine 1351, the lead engine, was almost bottom up, down a slight fill, to the right of the other engine, and about 25 feet from the track; the second car was demolished, while engine 3715 and the other four cars came to rest on their right sides, the head end of engine 3715 being 269 feet from where a rail was partially torn out at the initial point of derailment, and 13 feet west of the pilot of engine 1351. The first, seventh, eighth and ninth cars, and forward truck of the tenth car, were derailed to the left, and came to rest opposite the five cars first-mentioned, either partially or wholly on the roadbed, four of them remaining upright, and one, the first car, coming to rest on its right side; this car was opposite engine 3715; the eighth car was demolished. The employees killed were both enginemen and firemen.

Summary of evidence.

Conductor Eastman stated that between Lamy and the point of accident one stop was made, and on getting off on the left side of the train he saw some torches on the ground beside the engines, however, before he got to the head end of the train to ascertain its cause, the flagman was called in and the train departed. He heard the whistle signal sounded for the east crossing at Domingo, stated the speed was about 40 or 45 miles an hour passing this point, and felt the air brakes applied at the west

switch at Domingo, 7,567.3 feet east of the point of accident. Conductor Eastman did not recall anything else happening from this time until the accident occurred. He noticed nothing out of the ordinary in regard to the speed of the train after the stop was made, between Lamy and Domingo, and stated that had he felt that the train was traveling at too high a rate of speed he would have taken action accordingly. Conductor Eastman stated the air brakes were working properly.

Flagman Johnson stated that the stop made between Lamy and Domingo was of about 2 minutes duration and that he saw torches on the ground on the left side of the engines, he estimated the speed of the train passing Domingo to have been between 50 and 55 miles an hour, and stated he felt the train lurch going around about the first curve west of Domingo. Flagman Johnson stated that ordinarily this train does not pass Domingo at this rate of speed, also that the air brakes are applied when rounding curves, however, in this instance this was not done and he felt that the train was traveling at a dangerous rate of speed, so much so that it occurred to him to apply the brakes from the train, but before he definitely decided to do so, waiting a while calculating on the engineman using his judgment to reduce speed, the accident occurred.

Train Porter Marable said that when the stop was made between Lamy and Domingo he got off on the right side and started forward to see what was the trouble, he saw one man on the ground opposite the lead engine, and on calling to him was told that something about the engine was hot. The engineman whistled off at about this time and the train proceeded. Train Porter Marable estimated the speed passing Domingo at 35 or 40 miles an hour, and said that the whistle was sounded for a road crossing east of Domingo and he thought it was also sounded for a crossing west of Domingo, he also thought there was an application of the air brakes in the vicinity of the west switch.

Pullman Conductor Goodrich stated that the air brakes were not applied at one or two points en route where it is customary to steady the train, and between Lamy and Domingo it appeared that at a couple of points on curves the cars lurched more than usual. He did not notice the

sounding of the whistle, or any application of the air brakes, in the vicinity of Domingo, and said the speed did not vary much between the station and the point of accident, although in another part of his testimony he said that just before the accident occurred he felt so uneasy about the way the train was traveling that he stopped the work he was doing. He also said some of the passengers in the rear cars, after the accident, told of being alarmed at the speed.

Pullman Conductor Anderson did not think the train was handled any differently than usual, although after the accident some of the passengers commented about its speed, he remembered that the whistle was sounded in the vicinity of Domingo, but was unable to fix the location of the train at the time.

Express Messenger Bradfield said he had looked out of a door as the train passed Domingo, that its speed did not seem to be higher than usual, and that he thought the train was being handled in about the usual manner, he estimated the speed at about 35 miles an hour, and said the engineman whistled for one of the road crossings as well as for the station.

Postal Clerk Pratz stated he had been assigned to train No. 9 almost continuously for the past 12 years, and that the speed was exceptionally high on this occasion, at least 60 miles an hour passing through Domingo and until the accident occurred, he heard the station whistle signal sounded and made an effort to catch the mail pouch at this point, but missed, attributing his failure to the speed at which the train was traveling.

Members of the train crew stated they thought the stop made between Lamy and Domingo was due to something being hot on the engine, although it was stated it could not have amounted to much, and the train started before any of them got to the head end of the train to definitely ascertain the cause, there was a wide discrepancy in the various statements as to the location of this stop.

Division Engineer Roach, who was a passenger on the train, said he had noticed that the speed was quite high, while after the accident some of the passengers said they had thought the speed was excessive. Division Engineer

Roach said he made a careful examination of the track, and as a result expressed the opinion that the accident was due to the train being operated around the curve at a speed in excess of 50 miles an hour.

Operator Whitehorn, on duty at Domingo, heard the whistle signal sounded for the station, and the road crossing, while placing the mail pouch on the crane, and stated the headlight was burning brightly when the train passed, at which time the engines seemed to be drifting, while the speed appeared to be higher than usual; she did not hear any more whistle signals sounded between the time the train passed the mail crane and the occurrence of the accident. Operator Whitehorn's daughter, and signal Maintainer Lehew, stated that they talked to Fireman Hall, who remained conscious for a while after the accident, and he told them that the train was going very fast, Miss Whitehorn stating that he estimated the speed to have been about 60 miles an hour.

Signal Maintainer Rose was at the station at Domingo watching the headlight of train No. 9 as it approached, and he emphatically stated that he heard both engines working steam from the time they passed the station until the crash came, he did not think the train was traveling faster than usual when passing the station. Signal Maintainer Rose also said the whistle was sounded for the road crossing west of the station.

Hostler Johnson stated that on arrival of train No. 9 at Lamy he filled all the main-pin cups on both engines with grease, and at this time they were no warmer than usual, that whenever there is anything wrong with an engine the engineman usually makes it known, but that no mention was made of anything wrong by any member of this crew on this occasion.

County Health Officer Davis, a regular licensed physician, stated he was present when the body of Engineman Blevins, of the lead engine, was removed from the wreckage, and in his opinion the death of the engineman was instantaneous and preceded the derailment, pronouncing it due to heart shock and failure.

Inspection disclosed that nine rails were damaged or torn out of the north side of the track, and seven on the south side. The first rail to be damaged was on the north or outside of the curve, the receiving end of this rail was still securely bolted and spiked, but the spikes at the leaving end were partially drawn, evidently caused by the outward tipping of the rail. This tipping was carried to the next rail, which at its leaving end was torn from the ties and badly twisted, and, from this point on, for a distance of more than 230 feet, the track was entirely torn up. There was no evidence of wheel marks on the ties or rails to indicate where the engines left the track, the indications being that they straightened out the rails on the outside of the curve and turned over clear of the roadbed. At a point 81 feet west of where the first rail was torn out, and about 20 feet north of the track, a quantity of coal was found, 35 feet west of this point was the safety valve cap of engine 1351, and just a few feet farther, on top of the right embankment, which is only a few feet in height at this point, was the mechanical coal passer and its air cylinder, from engine 1351 and some of the reversing gear from engine 3715. The distance these appurtenances were thrown indicates that the engines overturned while running at a very high rate of speed.

Some question being raised as to the hardness of the first rail to be disturbed, an examination of the same was made by James E. Howard, engineer-physicist, who found that while it was slightly softer than the succeeding rail, yet the centrifugal force developed as the train rounded the curve apparently exceeded the strength of the track structure, and that it was this that turned the rail outward and twisted the succeeding rail sufficiently to permit some of the wheels or their flanges to shear off the lower edge of the head on the gauge side. These rails furnished no evidence of any other cause than the high rate of speed at which the train was moving.

Engine 1351 is of the 4-6-2 type, having a total weight, engine and tender loaded, of 464,540 pounds; its driving wheel base is 13 feet 8 inches, and total wheel base, engine and tender, 66 feet 11 3/16 inches, it was received from the shops on April 11, 1923, after having received a general overhauling.

Engine 3715 is of the 4-8-2 type, having a total weight, engine and tender loaded, of 585,420 pounds; its driving wheel base is 18 feet, and total wheel base, engine and tender, 76 feet 9 5/8 inches.

A representative of the Bureau of Locomotive Inspection of the Interstate Commerce Commission participated in the investigation of this accident, and in the careful examination which was made of the two engines, both before and after they were picked up. Engine 3715 was found to be in good condition, but as to engine 1351 it was found there were indications that the left side of the engine truck frame had been striking on the left front engine truck box prior to the derailment, having worn a groove in the frame 1/16 inch deep. The right main pin was found loose in the pin fit, but remained in place until the engine was rerailed. Indications were that this pin was slightly loose and working in the fit prior to the derailment. The right main driving wheel was also found to have been loosened, while the pin hole in the bottom of the right link at the eccentric rod connection was broken out, and examination disclosed what appeared to be an old fracture 1/2 inch in depth; this apparently did not fail, however, until after engine 1351 had been derailed and struck by engine 3715, at which time all the rods on the right side were bent, the main driving wheel knocked loose, main pin fit forced, and the eccentric arm and rod knocked off. The main wheels were mounted and the pins pressed in at the Baldwin Locomotive Works in October, 1922. On account of the engine frame being sprung, the axles bent, and the pedestal binders forced out of place, the engine could not be trammed, but judging from the uniform wear on the tires the engine must have been in tram prior to the derailment. On account of damage sustained, the No. 2 engine truck wheels and the trailer wheels could not be measured for lateral motion; the other wheels were within the prescribed limits. Examination of the daily inspection reports covering these two engines for 30 days prior to the occurrence of the accident failed to show anything which could have had any bearing on the cause of the accident. While it is possible there may have been something about these engines which entered into the cause of the accident, such as the condition found to have existed at some time on the left side of the truck frame of engine 1351, and the lateral motion on those wheels which could not be measured on account of damage sustained, yet there was nothing to show that such was the case.

The minimum time permitted by time-table instructions for all passenger trains between Lamy and Elota, a distance of 37.1 miles, within which territory this accident occurred, is 55 minutes, or an average of 40.4 miles an hour. This train, however, according to the train sheet, traveled the distance between Lamy and Domingo, 30.1 miles, in 43 minutes, an average speed of 43 miles an hour, not taking into consideration the stop of about two minutes made between these points, allowing for this stop, the average speed would have been more than 45 miles an hour.

Conclusions.

This accident was caused by excessive speed.

While conflicting in many details, the evidence is clear that Engineman Blevins, in charge of the leading engine, was in full possession of his faculties when his train approached Domingo, as he sounded the station whistle and also sounded the whistle signal for one of the road-crossings in the vicinity. The weight of evidence indicates that the train passed the station at Domingo at a probable speed of 40 or 50 miles an hour, and that no application of the air brakes was made between that point and the point of derailment, and the ante-mortem statement of the fireman that the speed was about 60 miles an hour at the time of the derailment is believed to be approximately correct, and is supported by the condition of the wrecked equipment. Dr Davis, county health officer, stated that Engineman Blevins did not sustain injuries sufficient to cause his death, which he said was due to heart shock and failure, and it seems probable that this occurred shortly before the accident and thus explains why the speed of the train was not properly controlled approaching the curve on which it was derailed.

All of the employees involved were experienced men, 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 laws.

Respectfully submitted,

W. P. BORLAND,

Director.