INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE DENVER AND RIO GRANDE WESTERN RAILROAD NEAR BARRANCA, N. MEX., ON JULY 17, 1929.

October 9, 1929

To the Commission

On July 17, 1929, there was a derailment of a passenger train on the Denver and Rio Grande Western Railroad near Barranca, N Mex., which resulted in the death of two employees, and the injury of eight passengers, one mail clerk, two employees on duty and one employee off duty.

Location and method of operation

This accident occurred on the Santa Fe Branch of the Alamosa Division, which extends between Antonito, Colo., and Santa Fe, N Mex., a distance of 125.6 miles, and is a single-track narrow-gauge line over which trains are operated by time-table and train orders, no block-signal system being in use. The accident occurred at the east approach of Bridge 346A, located 1.5 miles west of Barranca, approaching this point from the east the track is a series of sharp curves and short tangents, following which the track is tangent for a distance of 212 feet and then there is a 23° curve to the left 376 3 feet in length, including spirals, the accident occurring on this curve at a point where the maximum curvature begins. The grade for westbound trains is heavily descending for a distance of approximately 2,500 feet to the point of accident, and is 3.10 per cent where the derailment occurred. The maximum speed permitted for passenger trains in the vicinity of the point of accident is 18 miles per hour.

The track is laid with 70-pound rails, 30 feet in length, with an average of 19 ties to the rail-length, fully tie-plated, double-spiked and equipped with rail anchors. It is ballasted with natural sandy loam and is maintained in good condition. Bridge 346A is 96 feet in length and is laid with standard-gauge ties. A wooden guard rail is bolted to the outer ends of the ties for the entire length of the bridge, the distance from the gauge side of the rail to the center of this guard rail is about 36 inches.

The weather was clear at the time of the accident which occurred at about 10.56 a.m.

Description

Westbound passenger train No. 425 consisted of one combination mail and baggage car, one combination baggage car and coach, and one coach, all of wooden construction, hauled by engine 174, and was in charge of Conductor Hines and Engineman Reddington. This train left Barranca at 10.49 a.m., on time, and upon reaching bridge 346A it was derailed while traveling at a speed estimated to have been between 22 and 30 miles per hour.

The engine apparently overturned on its right side at a point approximately 5 feet west of the east approach of the bridge, slid the full length of the bridge, and then dropped down the 9-foot fill on the north side of the track, coming to rest almost bottom up in a badly-damaged condition. The tender cistern was torn from its frame and practically demolished, the frame remaining attached to the engine. The first car came to rest at right angles to the track, with its forward end in the ravine north of the trestle and its rear end on the trestle, the second car remained on the trestle leaning against its southern edge and partly overhanging the ravine, and the third car was down in the ravine about 75 feet from the track. The cars were so badly damaged that they were dismantled and the wooden parts burned. The employees killed were the engineman and fireman, and the employees injured were the conductor and brakeman, and an engineman who was deadheading.

Summary of evidence

Conductor Hines stated that upon arrival at Barranca his train was brought to a stop for an air-brake and general inspection, which was performed by the train crew, and before leaving that point he turned up the retainer at the head end of the first car, which had a retainer on each end. As the engineman had not been over this territory for several years he cautioned him to be careful on the descending grade west of Barranca. He then gave a proceed signal, boarded the train between the first and second cars, and blew the retainer to determine if it was operative. After watching the performance of the train for a short time he entered the baggage car and began arranging its contents, as there was no baggageman on the train. The speed of the train did not seem to be unusual and he felt that the engineman had it under full control until it entered the tangent east of the curve on which the accident occurred. At this point the air brakes were released and the train

immediately increased speed rapidly. The engineman's action in releasing the brakes alarmed the conductor, who said it was unusual to release them on tangent track, and he started towards the platform to set hand brakes but before he could reach it the car in which he was riding was derailed He said the engineman gave no signal or warning of danger prior to the accident, neither did he whistle for brakes at any time on the descending grade. The conductor estimated the speed at the time the brakes were released at 18 miles per hour and at the time of the accident at 25 miles per hour. Conductor Hines further stated that he was positive that the air brakes were in proper working order when they were inspected at Barranca and that the retainers also were in operating condition. It also appeared from his statements that the general practice is to release the brakes when rounding curves and to hold them applied on tangents or reduce the speed sufficiently to release them in safety in order to recharge the train line.

Brakeman Bush stated that the air brakes functioned properly between Antonito and Barranca, and at the latter point they were inspected and tested by noting the piston travel, recharging the train line and then releasing the brakes, Brakeman Bush said he also set up and tested three retainers, one at the rear end of the first car and one on each of the other two cars, and found that they worked satisfactorily The train was operated in the usual manner on the descending grade west of Barranca, the brakeman saying that he thought the brakes were released once prior to the time they were released on the tangent east of bridge 346A The speed at this time was about 17 or 18 miles per hour, too fast to justify releasing the brakes, and as it increased rapidly he started setting a hand brake but about the same time he felt the shock of the accident and he either jumped off or was thrown from the train. He thought the speed at the time of the accident was between 22 and 23 miles per hour.

Engineman Walsh, who was deadheading on train No. 425, stated that when the train left Barranca the engineman worked steam for about one-fourth mile and at that time the train had attained a speed of about 20 or 25 miles per hour The engineman then shut off steam and permitted the train to drift until it started down the descending grade, when he applied the brakes and reduced the speed. Upon reaching a point approximately 2,000 feet from the point of accident the brakes were released and after the train had traveled a distance of about 750 feet they were again applied and seemed to hold

well A short time later they were released and he felt no further application of the brakes prior to the accident. As the speed increased rapidly after the second release he became apprehensive as to whether the train would round the curve in safety and upon looking out of a window in the car in which he was riding he observed that the engine was swaying considerably and then appeared to turn over when it reached a point about an engine-length beyond the eastern end of the bridge. He estimated the speed of the train when the brakes were released the last time at 25 miles per hour, and at about 30 miles per hour at the time of the accident. Engineman Walsh further stated that prior to the date of the accident he had been operating engine 174 on the Santa Fe Branch for more than two years and he considered it a good curving engine, the retainers on the cars involved also worked exceptionally well and the train could be held at any speed on the grade. He said Engineman Reddington had had a number of years' experience in operating engines on mountain grades and could not account for his failure to apply the brakes after the second release unless he thought that the train was not running at a dangerous rate of speed and would round the curve in safety Engineman Walsh also was unable to account for the failure of the fireman, with whom he had previously worked, to take some action as he said the fireman was very particular about running and would not hesitate to mention it if he thought any risk was being taken.

Section Foreman Trujillo stated that the last time he passed over the track in the vicinity of the point of accident was during the morning of July 15 and at that time he noticed no irregularities. He arrived at the scene of the accident at 1.30 p m. on the day of its occurrence, and on examining the track east of bridge 346A he was unable to find any defects or marks on the ties. The first marks of derailment appeared on one or two ties on the bridge about 5 or 6 feet from its eastern end, but he did not know whether they were made by the turning over of the engine, or by the cars after they were derailed He also noticed marks on the guard rail which he thought were caused by the engine having been overturned.

Roadmaster Eagan stated that on the morning of July 18 he thoroughly inspected the track but found no indications of marks on the rails or ties approaching the bridge. The first marks appeared on the guard rail,

beginning at the east end of the bridge, and they extended its entire length. There were also marks on two ties near the east end of the bridge which he thought were caused by a driving rod pin, as they were too wide for flange marks. Upon examining the engine he found that slivers and small pieces of wood were wedged between the cylinder cover and cylinder, and also on the pins. These conditions indicated to him that the engine started to turn over just before it reached the bridge and that the guard rail kept it from falling off the bridge until it reached the opposite end. It was his opinion that a train of the same character as that involved in the accident would take the curve on which the accident occurred at 30 miles per hour.

Division Engineer Johnson stated that he examined the track approaching the bridge and found it to be in good condition, there being no flange marks on the rails or ties, neither were there any such marks on the bridge. Two rails had been removed from the bridge due to their having been kinked as a result of the accident, but there were no flange marks on these rails. There was a slight variation in the line and elevation of the track when approaching the bridge from the east, but he considered it safe for a speed of 18 miles per hour, and he said he found nothing in connection with the track, bridge or equipment, that would in any way contribute to the cause of the accident, and he was of the opinion that excessive speed caused the engine to tip over and that it then slid the entire length of the bridge. Mr. Johnson also stated that their standard elevation for a 23° curve was 2 and 7/8 or 2 and 15/16 inches, and it appeared that this was the approximate elevation at the point of accident.

Master Mechanic Lewis stated that engine 174, which is of the 4-6-0 type, came out of the shops on March 31, 1928, after having been overhauled. He inspected this engine, as well as the cars, at the scene of accident on July 19, and found that all tires and flanges were in good condition and that there was no wear apparent on the treads or the wheels. The lateral of the engine was less than the maximum permissible, and all brake shoes were intact and resting against the tires, the throttle was open, but he did not know whether this was caused by the accident. The tender cistern was demolished and he could not locate its retainer but the retainers on the cars were in the holding position, except one which also was lost. The cylinder casing on the right side of the engine was scratched and burned from friction and the guide yoke on the same side was

bent back, while there were numerous splinters on parts of the cylinder and on the pins which indicated that the engine had slid across the bridge on its right side.

Trainmaster Broderick stated that on the day of the accident he inquired of the engineman of train No. 425 as to how long it had been since he had made a trip over the Santa Fe Branch and the engineman replied that it had been more than 15 years Trainmaster Broderick then produced a time-table and pointed out the speed restrictions on the branch, particularly calling his attention to the 18-miles-per-hour restriction on Barranca hill and explaining that this piece of track consisted of sharp curves, short tangents and a 4 per cent grade, and he said the engineman replied that he understood all of the requirements Trainmaster Broderick also examined the derailed equipment, track and bridge at the scene of accident and from all the indications, which were similar to those mentioned by other witnesses, he concluded that the engine overturned at the east end of the bridge, due to excessive speed, and that it then slid across the bridge and dropped off the roadbed at the opposite end.

An examination of the track approaching the eastern end of bridge 343A, made by an inspector of the Commission, as well as an examination of the bridge itself, and of the equipment involved in the accident, failed to develop anything contrary to the conditions as described by the various witnesses.

Conclusions

This accident was caused by the failure of Engineman Reddington to control the speed of his train on a sharp curve and heavy descending grade.

It appears that the brakes were inspected and tested at Barranca and that four retainers were set in holding position before leaving that point. The engineman applied the brakes when the train started down the descending grade west of Barranca, which application reduced the speed and appeared to hold the train properly. While the train was descending the grade the brakes were released and after it had traveled a short distance they were again applied, but upon reaching a point in the vicinity of the leaving end of the first curve east of the curve on which the accident occurred they were again released, this being at a point considered by most of the witnesses as a dangerous point at which to release brakes,

and no further application prior to the accident was felt by any of the surviving employees

There were no flange marks on the track approaching the bridge, or on the bridge, although the guard rail extending across the bridge on the outside of the curve was damaged its entire length. An inspection of the engine showed that the right cylinder was burnished, in fact it had been burned blue at one point from friction, and that splinters of wood were wedged in the cylinder cap and between the rods and pins, and that the right guide yoke was bent backward. These conditions, as well as the statements of the deadheading engineman, indicate that the engine overturned at the east end of the bridge as a result of excessive speed and then slid along on the guard rail until it reached the opposite end of the bridge.

Engineman Reddington was an experienced man in mountain territory and the reason why he failed to control the speed of his train could not be definitely determined. Attention is called to the fact, however, that he had not made a trip over this branch for more than 15 years, making it necessary for the trainmaster to talk it over with him and to point out various dangerous conditions, and attention is also called to the fact that the day of the accident was his first trip of any kind since November 24, 1928, a period of nearly eight months. Investigation developed that it was somewhat of a practice for Engineman Reddington, who was 61 years of age, to lay off for extended periods during the winter and spend the time on his nearby ranch, and it did not appear that there was anything wrong with him physically which would have prevented him from properly performing his duty. Regardless of the man's experience and qualifications, however, the judgment of the officials is seriously questioned in allowing Engineman Reddington to operate a train in mountain territory of this nature without giving him an opportunity of going over the line first in order to observe the conditions and make himself familiar with them

The employees involved were experienced men although Engineman Reddington had not operated a train over the branch line involved for over 15 years. 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. P BORLAND,
Director.