INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE MAINE CENTRAL RAILROAD NEAR MARION, ME., ON JANUARY 29, 1926.

February 20, 1926.

To the Commission:

On January 29, 1926, there was a derailment of a passenger train on the Maine Central Railroad near Marion, Me., which resulted in the death of 3 passengers, and the injury of 14 passengers and 2 employees. The investigation of this accident was made in conjunction with the Public Utilities Commission of the State of Maine.

Location and method of operation

This accident occurred on that part of the Eastern Division extending between Washington Junction and Calais, Me., a distance of 101.85 miles, this being a single-track line over which trains are operated by time-table and train orders, no block-signal system being in use. Under bulletin 54 of January 25, 1926, the speed of passenger trains within this territory is restricted to 35 miles an hour, while the speed of all other trains is restricted to a maximum of 20 miles an hour. The accident occurred at a point nearly 1½ miles west of the station at Marion, approaching this point from the east the alignment is a succession of tangents and curves, followed by 1,117 feet of tangent and a 6° curve to the left which is 991 feet in length, the first mark of derailment being on this curve at a point 209 feet from its eastern end. The grade for westbound trains is from 1.30 to 1.51 per cent descending for a distance of nearly 1 mile. At either end of the curve the track passes through a cut, but practically all of the curve is on a fill which is about 20 feet in height at its maximum, near the center of the curve, where there is a stone culvert through which passes a small brook.

The track is laid with 60-pound rails, 30 feet in length, rolled in 1898 and laid in the track in the same year, weber joints are used. There is an average of 17 or 18 ties to the rail-length, single-spiked, and ballasted with gravel to a depth of about 1 foot. Tie plates and rail braces were in use on the curve on which the accident occurred.

The weather was clear and cold at the time of the accident, which occurred at 3.34 p.m.

Description

Snow plow extra 315 was operated ahead of train No. 414 from Calais to Ayers Junction, a distance of 16.09 miles, and at the latter point orders were issued that these trains were to be operated as sections of train No. 414 from Ayers Junction to Washington Junction.

Train No. 414 as it originated at Calais consisted of one corbination mail and baggage car, one Pullman sleeping car, one smoking car and one coach, hauled by engine 316, and was in charge of Conductor Fallon and Engineman Gray. The first two cars were of steel construction, while the last two cars were of wooden construction. At Ayers Junction an express car, of wooden construction, was picked up and placed in the train immediately behind the engine, and the train departed as train second No. 414 at 3.04 p.m., 10 minutes behind the first section, which had departed on time. Train second No. 414 left Dennysville, the last open office, 4.32 miles from Marion, at 3.18 p.m., stopped at Marion, which is a flag station, and was derailed west of Marion while traveling at a speed estimated to have been from 25 to 30 miles an hour.

The train came to rest with the engine and first two cars on the rails, while all of the wheels of the sleeping car were on the rails with the exception of the middle pair of wheels under the forward truck, which were derailed to the north, or toward the outside of the curve. The last two cars were entirely derailed on the outside of the curve, the smoking car remained attached to the rear of the sleeping car, but was leaning to the right at an angle of about 45°, while the coach broke away and came to rest on its right side approximately 140 feet back of the smoking car, with its head end about 30 feet from the track. Both of these cars were so badly damaged that they were not repaired. The distance from what was thought to have been the first mark of derailment to the head end of the sleeping car as it finally came to rest was 739 feet.

Summary of evidence

Shortly after the occurrence of the accident a medical train, consisting of one combination car, one coach and a caboose, hauled by engine 151, was operated from Calais to the point of accident, this train being in charge of Conductor Carter and Engineman Eaton. This train left Calais at 5.05 p.m., and reached the scene of the accident at about 6.10 p.m. Through error, however, it proceeded too close to the point of accident and was also derailed; none of the equipment in this train was overturned and no injuries resulted.

Train first No. 414 was stopped at Whitneyville, 21.51 miles west of Marion, and returned to the scene of the accident. Conductor Gillis was the only member of this crew to go back toward the eastern end of the curve in an endeavor to ascertain the cause of the derailment of train second No. 414, and he said that at that time he found that engine 151, of the medical train had been derailed, making it difficult to determine exactly what had occurred. All the members of the crew of train first No. 414 stated that their train had passed around the curve at a speed of about 25 miles an hour and that they had not noticed any rough riding or anything to indicate that the track was not in good condition. Extra Gang Foreman Allen, in charge of the flanger in train first No. 414, said that the flanger was very light and that any uneven track condition would have been noticeable, but on this occasion the flanger rode smoothly and apparently the track was in good condition.

Engineman Gray, of train second No. 414, said he had made a brake-pipe reduction before reaching the curve on which the accident occurred and that the engine was drifting, moving at a speed of 26 or 28 miles an hour, when he noticed that the brake-pipe pressure was being reduced. He at once placed the brake valve in the emergency position and estimated that the train ran an additional distance of about 2½ car-lengths before being brought to a stop. Engineman Gray had passed over this portion of the road on the day previous to the accident, and neither then nor at the time of the accident did he feel any roughness in the track. About 10 days previously, however, he had noticed a rough spot which he had called to the attention of the section foreman, resulting in the latter shimming the track at the point in question which was under the north rail just east of where train second No. 414 was derailed. The statements of Fireman Stanhope brought out nothing

additional of importance, while on account of injuries sustained by them in the accident no statements were obtained from Conductor Fallon and Flagman Bleakley, all of train second No. 414.

Baggagemaster Gallison, who was riding in the combination mail and baggage car, said the train was moving at a speed of about 25 miles an hour when he felt a shock as if the air brakes had been applied in emergency and at first it caused him to think that the engine had broken away from the train. After the train had come to a stop he gave some flagging equipment to the express messenger to enable the latter to go back and protect the rear of the train, and after assisting the injured passengers he inspected the first three cars in the train, finding all the wheels on the rails with the exception of the middle pair of wheels under the forward truck of the sleeping car. He then started back toward the station at Marion with a lighted lantern, it having become dark in the meantime, and while he did not make a careful examination of the track he did ~~xxx~~ notice that the shims under the north rail seemed to be turned up, while the rail was canted outward to a slight extent.

Express Messenger Mosher did not notice anything except that the train stopped at an unusual location. He then went back to protect the rear of the train, going as far as the station at Marion, but did not observe anything wrong with the track. Route Agent Warner, also employed by the express company, said his first knowledge of anything wrong was when he heard a noise which resembled a burst air hose. After assisting the injured passengers he also went back to protect the rear of the train and while walking back he thought he saw a rail on the north side of the track which appeared to have an old break, or a worn spot, but afterwards when returning to the scene of the accident, he did not find this place in the track.

Mail Clerk Rollins said he felt something which indicated that the train had passed over a rough spot in the track. He had felt similar motions of the car at various times in the past, however, and did not think anything about it until the train was brought to a stop. The statements of Mail Clerk Griffin brought out no additional facts of importance.

Pullman Conductor Cutts said he was in about the center of the sleeping car when he felt what seemed to him to be ice on the rails, following which the car began to bump along on the ties, there was no side sway, however, the car continuing to move straight ahead until

it stopped. He estimated the speed to have been about 25 miles an hour at the time the accident occurred. Fullman Porter Bernard said he felt what at first appeared to have been the rough riding of the car but almost immediately he realized that it was derailed, the train being brought to a stop shortly afterwards.

The medical train from Calais was operated as extra 151. Engineman Eaton of this train said it was dark when he approached the point where train second No. 414 had been derailed, moving at a speed of about 8 miles an hour, after having picked up at the station at Marion the express messenger who was acting as flagman. Both Engineman Eaton and his fireman were on their respective seat boxes maintaining a careful watch of the track ahead but Engineman Eaton said he did not discover anything wrong until suddenly the front end of the engine seemed to raise upward and he at once applied the air brakes in emergency. The statements of Fireman King as to the movements of extra 151 were practically the same as those of Engineman Eaton except that he said that just before the engine was derailed he saw some one start toward them with a white lantern and he at once called to the engineman, it being at about this time the engine was derailed.

After the derailment of extra 151 Engineman Eaton, Conductor Carter, Baggagemaster Godfrey, and Brakeman Norwood, all of extra 151, made an examination of the track and of the derailed equipment of their train. The statements of these employees as to the exact position of the derailed wheels under their train did not agree, but all of them saw a broken rail on the south side of the track, the engineman, conductor, and brakeman saying that the rail had broken near its receiving end. Engineman Eaton said the long portion of this rail had been turned on its side while the adjacent rail had been canted outward to a slight extent, Conductor Carter also remembered seeing an overturned rail on the south side of the track but did not remember its location in the track with respect to the broken rail, while Baggagemaster Godfrey thought there was an overturned rail on this side of the track but was not at all positive about it. Conductor Carter thought the broken rail was the cause of the derailment of extra 151, although it appeared from his statements that some of the wheels under his train were detailed before reaching the point where the broken rail was located. Engineman Eaton further stated that one of the rails on the north side of the track was canted outward, which statement was agreed to by Brakeman Norwood, who also said that some of the derailed wheels were standing on the web of this rail. It further appeared from the statements of Engineman Eaton that he had been over this portion of

the road quite frequently, the last time being on the day prior to the accident, he had not noticed anything wrong with the track and considered that its general condition was good.

Roadmaster Whitney was at a station west of the point of accident and reached the scene before the derailment of extra 151. After assisting in the immediate vicinity of the wreckage he walked eastward and made a hurried inspection of the track but did not find anything wrong and returned to assist in the work around the derailed cars. After extra 151 had been derailed he returned to that point and found a broken rail on the south side of the track about 16 feet west of what appeared to have been the first flange mark made by the equipment of train second No. 414. This rail had broken at a point 2 feet 3 inches from its leaving end and the longer portion of the rail, comprising the receiving end, was canted very slightly; this was the section of rail which afterwards was found to have flange marks on the web which were due, however, according to other witnesses, to its having been used in derailing the equipment of extra 151. Mr. Whitney did not make any measurements of the gauge or elevation of the track until after the equipment of extra 151 had been derailed which was early the following morning.

Section Foreman Stevens did not reach the scene until after extra 151 had been derailed, and when he d arrive he did not make any examination of the track bu immediately engaged in assisting where the passenger c were derailed. He said he had last inspected the track on the second day prior to the accident, passing over i twice that day, but had noticed nothing wrong, at that time he did not measure the gauge or elevation, but examined the shims as was customary when inspecting the track. He said he had placed some 3/4-inch shims under the north rail for a distance of approximately 30 feet, this having been done about 10 days previously after Engineman Gray had called his attention to a point where repairs were needed; the shims were put in on the following day and at the same time he placed some shims under the track near the leaving end of the curve. This shimming had been made necessary by the heaving of the track on the inside of the curve, resulting in the outside rail being too low. When repairing the track after the accident he replaced the 3/4-inch shims at the eastern end of the curve, just east of the first mark of the derailment of train second No. 414, with some larger shims, some of which were 2 inches in thickness. Section Foreman Stevens was asked when the track had heaved sufficiently to require the substitution of 2-inch shims for

shims 3/4 inch in thickness, and he said that the thicke shims furnished from 1/4 to 1/2 inch excess elevation, allowing for additional heaving of the south rail.

Trackman Scott reached the scene of the accident shortly after its occurrence, prior to the derailment of extra 151, but although he passed over the point where train second No. 414 was first derailed, he did not stop to examine the track and did not notice anything unusual about its condition. He said he had last inspected the track on the morning of the accident, but did not find anything wrong, nor did he receive any word from any one that the track was not riding properly. He further stated that he had gauged the track on the curve on the day before the accident, and at that time he found the gauge to be open, varying from 1/4 to 1/2 inch.

Motive Power Foreman Kenison reached the scene after extra 151 had been derailed. He first examined the express and the combination mail and baggage cars, of train second No. 414, in order that those cars might be sent forward to their destinations; he noted that one pair of wheels under the sleeping car was derailed, and then proceeded to the point where engine 151 was derailed. This engine is of the 4-4-0 type, he found both pairs of engine-truck wheels derailed to the right or north, and the left forward driving wheel on the rail with the opposite driving wheel on the inside of the north rail, while both rear driving wheels had been derailed to the south. The lead pair of wheels under the forward tender truck was derailed to the south, while the rear pair of wheels under this truck was derailed to the north, as was also the case with all of the rear tender-truck wheels. All the wheels of the forward truck of the combination car were derailed to the south, while all of the wheels under the rear truck of this car were derailed to the north. At the time of his examination the coach had been rerailed, but the statements of other witnesses indicated that the left forward wheel of the front truck had been derailed to the south while the right rear wheel was derailed to the north, the other wheels under this truck were not derailed. His examination of the track showed that there was a broken rail on the inside of the curve, the break having occurred at the leaving end of the rail. The longer portion, composing the receiving end of this rail, was turned over, while there was a rail on the north side of the track which was canted outward, but not enough to prevent a wheel from running on it. The long portion of the broken rail was used in rerailing equipment, which accounted for flange marks on the web of this rail. Mr. Kenison examined the surfaces of the fractured rail but did not discover the presence of any defects.

Car Inspector Kavanagh made a detailed examination of the forward truck of the sleeping car at Bangor, but the report of this examination indicated he found nothing about the truck or wheels which could have caused the accident. He saw the marks on the wheels, but said those on the rear end of the car did not appear to be recent; he did not find any broken pedestals, in spite of the fact that some of them were of cast iron, and said he did not think the rear truck had been derailed, although the indications were that the forward truck had been derailed.

Foreman of Car Repairs Bonney verified the results of the examination made by Inspector Kavanagh. He also said that he went to the scene of the accident with the wreck train and found that two of the trucks, probably the rear truck of the smoking car and the forward truck of the coach, had come in violent contact with the stone abutments of the culvert, these trucks being demolished and two of the wheels loosened. He did not make any careful examination of the track, but noted the position of the sleeping car, with only the middle pair of wheels of the forward truck derailed, and he said that from his examination of this car he did not think any of the other wheels under it had been derailed Mr. Bonney also found in the wreckage a wheel with a worn-hollow tread and another with a worn flange, but not quite sufficient to take the gauge; on account of the condition of the wreckage, however, he was unable to locate the original position of these wheels in the train.

General Foreman Whitney, in charge of the Bangor wreck train, said that from his examination of the wheels of the sleeping car he thought that only the middle pair of wheels of the forward truck had been derailed, he considered that the marks on the other wheels were not of recent origin.

H. F. Noyes, Assistant Superintendent of Motive Power, said that on the day following the accident he made a careful examination of the wheels of the sleeping car and that there was no doubt in his mind but that every wheel on the south side of the car had been entirely derailed on the inside of the south rail. Supt. of Motive Power Garrett also stated that the wheels on the south side undoubtedly had been derailed, those wheels toward the head end of the car being marked to a greater extent than those toward the rear end. He did not notice indentations on the inner surface of the flange of the second wheel on the right side of the forward truck, but he did state however that the wheels

on the right side must have been off the rails, although all the evidence of severe chafing or rubbing was on the wheels on the south side of the car.

Car Inspectors Polyott and Bailey, located at Calais, said they examined the equipment of train second No. 414 when it arrived at Calais on the morning of the accident in train No. 427, and also before it departed in train No. 414, the only thing noted being a defective hand brake on one of the cars, which was repaired. Car Inspector Moon, on duty at Washington Junction, said he examined the snow plow and flanger after its arrival at Washington Junction but found nothing wrong. He also had inspected the equipment in train No. 427 on its way eastward to Calais that morning but found nothing wrong.

The examination of the track indicated that the first mark of the derailment of train second No. 414 was a flange mark which appeared on the running surface of the north rail at a point about 7 feet 4 inches east of a joint, this mark leading toward the outside edge of the running surface for a distance of about 3 feet 4 inches before the wheel involved dropped off on the outside. The next marks appeared on a rail brace on the outside of the rail on the first tie beyond the joint tie, there was a mark on the top of this brace where something had passed over it, while there was a deep mark at the bottom of the brace, apparently made by a wheel flange. West of this point there were various flange marks on both sides of each rail, those on the outside of the south or inner rail extending only a short distance, apparently having been made by the equipment of extra 151. Some of those on the inside of the south rail led gradually to the north, as was also the case with some of those on the outside of the north rail. On the other hand, however, there were well-defined marks close to the gauge side of the south rail and the outside of the north rail which continued the entire distance around the curve to where the sleeping car came to rest, indicating that a wheel or wheels under that car had been rubbing against the north side of each rail; the more prominent of these marks consisted of chafing on the gauge side of the south rail and the shearing off of the tops of the angle-bar bolt heads, while the more prominent marks on the outside of the north rail consisted of deep marks on the receiving ends of the Weber joints and on such of the original rail braces as had not been knocked loose from their positions in the track, these marks were not so deep as the leaving end of the curve was approached. Arrangements were made to have the snow and ice removed from

the track and after this had been done a further and more detailed examination was possible. There were so many flange marks, however, that it was impossible to tell definitely when or how they were made. They were on both sides of each rail and some of them were east of the flange mark on the running surface of the right rail; these latter marks, however, as well as some of those west of this point, were believed to have been made either when extra 151 was derailed, or when the equipment of that train was being rerailed.

It further appeared that there was a broken rail on the inside of the curve, this rail having broken at a point 2 feet 3 inches from its leaving end, and approximately 16 feet west of where the flange mark first appeared on the opposite rail, no defective condition was observed on the surfaces of the fracture. It was also noted that there was a deep flange mark on the running surface of the receiving end of the adjacent rail, followed by a flange mark on the running surface which led off abruptly to the outside of the rail, being about 8 inches in length. None of the rails on the outside of the curve was torn out in the accident, nor could anything be discovered to indicate where the wheels on the left sides of the derailed trucks had crossed the outside rails at the time the cars left the roadbed, and at the time of this investigation those rails were still in service. In addition to the broken rail, two other rails on the inside of the curve were taken out of the track after the accident, having been slightly bent. Several flange marks were found on the web of the long section of the broken rail, but these marks are believed to have been made when the equipment of extra 151 was being rerailed.

The examination of the track also showed that near the eastern end of the curve the north rail had been shimmed for a distance of about 40 feet, the western end of the shimmed track being approximately at the point where the flange mark went off on the outside of the north rail.

Examination was made of the running gear of the sleeping car, particular attention being paid to the condition of the forward truck; examination was also made of the wheels and debris of the trucks of the smoking car and coach; the snow plow and flanger which were in train first No. 414, and also engine 151, but nothing was developed which would indicate a probable cause of the accident.

Conclusions

The cause of this accident was not definitely ascertained.

The investigation of this accident was complicated to a considerable extent by the derailment of extra 151 in the immediate vicinity of the point where train second No. 414 became derailed, resulting in the presence of so many flange marks on both sides of each rail that the marks made by the derailed equipment of train second No. 414 could not be entirely distinguished from those made by the equipment of extra 151. It is probable that the derailment of extra 151 accounted for some of the damage to the track in the way of overturned or canted rails, but in view of the fact that no one made any real examination of the track prior to that time, or took any measurements of the gauge or elevation, it was impossible to ascertain the extent of the damage caused by the equipment of train second No. 414 or to use that as a basis for determining what caused the accident. There was also a difference of opinion among the witnesses as to whether or not the sleeping car had been entirely derailed, but it is believed that at some time during the course of the derailment of train second No. 414 all of the wheels under this car were derailed and that all of them rerailed themselves with the exception of the middle pair of wheels under the forward truck. Nothing was discovered about this car, however, which it is thought could have contributed to the occurrence of the accident. It also appeared that some of the wheels under the coach which was the last car in the train were not in the best condition, there being a worn tread as well as a flange which approached the condemning limit, but it was not determined that this condition had anything to do with the cause of the accident.

With respect to the shims, it is to be noted that about 10 days prior to the accident it had been necessary for the section foreman to shim the outside rail of the curve in order to obtain sufficient elevation to allow for the heaving of the track on the inside of the curve. After the accident these shims, the majority of which were not more than 3/4 inch in thickness, were replaced by thicker shims, some of which were as much as 2 inches in thickness. Shimming to such an extent weakens the track, but the result which would be expected to follow would be the overturning of the outside

rail; this rail, however, was not disturbed to any appreciable extent and at the time of this investigation was still in service. The changing of the shims from those not more than 3/4 inch in thickness to shims which were 2 inches in thickness raises a question as to whether there was not a low spot at this point at the time of the derailment of train second No. 414. One of the mail clerks thought he noticed a rough spot in the track but there was nothing in the evidence of the engine or train-service employees to indicate that the track had not been riding smoothly or that there was any unevenness either when train first No. 414 or when the head end of train second No. 414 passed over the point where the cars were derailed, while the measurements taken on the morning after the accident showed that with two or three exceptions the gauge and elevation east of where the accident occurred were reasonably well maintained. Those measurements did not show a good condition from the approximate point of derailment westward toward the center of the curve, but this was after that part of the track had been subjected to the strain of the derailment and before the work of making the track safe for normal speed had been completed. The broken rail was clearly a result rather than the cause of the accident.

All the employees involved were experienced men and 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.