INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE CHICAGO, BURLINGTON & QUINCY RAILROAD AT MOSELEY, COLO., ON AUGUST 9, 1933.

December 14,1933.

To the Commission:

On August 9, 1933, there was a derailment of a passenger train on the Chicago, Burlington & Quincy Railroad at Moseley, Colo., which resulted in the injury of 21 passengers, 1 employee and 2 porters.

Location and method of operation

This accident occurred on the Akron and Denver Subdivision of the McCook Division, which extends between Akron and Denver, Colo., a distance of 111.42 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 the switch leading to an industrial track at Moseley; approaching this point from the east, the track is tangent for a distance of approximately 8 miles, and for some distance beyond. The grade at the point of accident is 0.2 percent ascending for west-bound trains.

The track is laid with 90-pound rails, 39 feet in length, with an average of 24 ties to the rail length, fully tieplated, single-spiked, with 4 rail anchors to the rail length, and is ballasted with slag to a depth of about 12 inches, the track is well maintained. The industrial track is approximately 2,200 feet in length and practically parallels the main track on the north; the switch is a facing-point switch for west-bound trains and leads off the main track through a no. 11 turnout. The switch stand is of the Ramapo Ajax no. 4 type and is located on the north side of the main track; it is equipped with a switch lamp mounted above a single-blade target. The switch works in conjunction with the automatic block-signal system, and the signals are operated if the switch points are open $\frac{1}{4}$ inch or more. Automatic signal N-461.5, the last west-bound signal, is located about 450 feet east of the switch.

The weather was clear at the time of the accident, which occurred about 11:25 a.m.

Description

West-bound passenger train no. 9 consisted of 1 combination mail and baggage car, 2 baggage cars, 1 combination baggage and smoking car, 2 chair cars, 1 Pullman sleeping car, 1 dining car, 3 Pullman sleeping cars and 1 lounge car, all of steel construc-

tion and in the order named, hauled by engine 3007, and was in charge of Conductor Cox and Engineman Gould. This train departed from Brush, 6.95 miles east of Moseley, at 11:15 a.m., 5 minutes late, and was derailed at Moseley while traveling at an estimated speed of between 50 and 55 miles per hour.

The engine and first two cars remained on the track and stopped with the front end of the engine approximately 1,600 feet beyond the switch; the third car remained coupled to this portion of the train but the rear wheels of the forward truck were derailed and the rear truck was torn from beneath the car, the rear end of the car stopping to the right or north of the main track, about 700 feet west of the balance of the train. The following seven cars were also derailed to the north, the fourth car stopped in an upright position in line with the track, the fifth car on its right side across the industrial track, and the sixth car leaning to the west at an angle of about 45° across the main and industrial tracks, while the balance of the derailed equipment remained upright with the forward end of the seventh car resting on an overturned rail of the main track and the rear end between the two tracks, with the last three derailed cars on the roadbed of the industrial track. The employee injured was the conductor.

Summary of evidence

Engineman Gould stated that the automatic signals east of Moseley were in clear position and there was nothing unusual about the riding of the engine before or when it passed over the switch. His first knowledge of anything wrong was when he felt the engine lurch, and upon observing that the air gauge indicated that the brakes were applied in emergency he looked back and saw that the rear end of the third car, with no truck under it, was dragging along the north side of the track. He had just previously looked at the speed recorder, at which time it registered 52 miles per hour, and he thought the train was traveling at about the same speed at the time of the accident. Shortly after the accident he inspected the engine and first two cars but found no indications of anything dragging, there being no marks on the ties under this portion of the train.

Fireman Husted stated that all signals were displaying clear indications and after opening a valve that operates a spraying device under the tender for the purpose of sprinkling a highway crossing near the switch he looked to ascertain if the water was running and saw the third car derail, followed almost immediately by the backward surge of the engine. He could not see the cars behind the third car on account of dust which was being stirred up and he was unable to state definitely whether or not the third car was the first to be derailed.

Brakeman Chipman was riding in the rear end of the fourth car and when the train reached the switch he felt the train lurch, followed immediately by dust rising on both sides of the car, and he realized that the car ahead was derailed, the car in which he was riding being derailed very shortly afterwards. From the position of the derailed trucks after the accident it was his opinion that the rear truck of the third car was the first to be derailed and that the derailment occurred near the frog of the switch.

Conductor Cox was in the fifth car and when it lurched suddenly he reached for the emergency cord, but before he could apply the brakes the car began to sway and turned over on its side. He examined the switch after the accident and said he found the throw rod broken, the rod connecting the switch with the switch box was bent, and there was a small nick on the tip of the north switchpoint; the north switch point was about 3 inches from the stock rail and the south point rested against the main track rail.

Section Foreman Pister stated that the last time he inspected the switch at Moseley was during the morning of August 7, at which time the switch appeared to be in good condition. He arrived at the scene of the accident about 10 or 15 minutes after its occurrence and upon examining the switch he found the north switch point open about 2 inches, but did not note the position of the south point. A light mark was on the reinforcement of one of the points and both points had been pulled 6 or 8 inches to the westward, while the switch rod had been broken. The first marks of derailment on the ties were at the heel of the switch, the points being $16\frac{1}{2}$ feet in length.

Track Supervisor Adams stated that he covered this territory daily, inspecting and testing all switches, and that he thoroughly inspected the switch involved between 8 and 8:30 a.m., August 8; so far as he could see it was in first-class condition at that time. Several hours after the accident he examined the track for about 600 or 700 feet east of the switch and observed small marks on the ties at intervals, some of these marks being on top of and others on the eastward edges of the ties, and he thought they had been made by something from a west-bound train dragging over them lightly; he did not examine the equipment of the derailed train. He further stated that in order to detect a flaw in the head rod at the point where it was broken it would have been necessary to remove the rod.

Signal Maintainer Neid, said he inspected the switch at Moseley on August 3 or 4 and no adjustments were necessary. He also passed over this switch twice during the morning of the accident, the last trip being about 11 a.m., and the

signals were in proper position, indicating that the points were fitting properly.

Trainmaster Hinshaw arrived at the point of accident about noon and after assisting injured passengers he examined the switch. The switch stand was properly locked, with no indication of the lock having been tampered with, and the switch points were lined for a main-track movement. He could not account for the cars being derailed on the industrial track until he discovered that the switch points had been moved toward the west, bending the signal switch box connecting rod; also the head rod, or no. 1 tie rod, was broken. The tie rods were straight and the points were in good condition except for a small bright mark on the north point and a slightly more pronounced mark on the re-inforcing bar of this point. It was his opinion the switch points had been pulled toward the west as a result of the tearing up of the frog, and that this was what bent the connecting rod.

Assistant Superintendent Murphy said there were no marks on the rails or ties between the points and the heel of the switch except on the first tie west of the no. 2 tie rod, where this rod had been shoved against the tie; the first wheel mark appeared on the ties about 28 feet west of the switch points. He walked east of the point of derailment for a distance of approximately 1 mile and observed fresh abrasions or light marks on a few of the ties between the rails; these marks were not regularly spaced and were not in any particular place with reference to the alignment of the rails, and from the character of these abrasions, being heavier on the east sides of the ties and tapering off to the west, it appeared that they were made by a west-bound train. He also inspected the track as to gauge and cross levels for a distance of about 75 or 100 feet east of the switch and found the conditions satisfactory.

The rod involved, which was the head rod, was $\frac{3}{4}$ inch by $2\frac{1}{2}$ inches by 7 feet 15/16 inch long, with a hole in each end for the purpose of connecting with the switch stand. The shoe which connects the switch point to the rod is held in place by a 1-inch bolt, held in place by a lock washer. The shoe is 5 inches wide and entirely covers the rod, making inspection of the rod under the shoe impossible without removal. It was through this bolt hole that the fracture occurred. The break on one side showed a crack on both the bottom and the top of the rod and extended in toward the center into porous or spongy dark metal, with only a trace of good metal holding. On the other side of the hole a crack had progressed from the top and bottom toward the center as well as from the side toward the hole in an irregular shape, leaving approximately 50 percent of good metal on that side; altogether, about 40 percent of good and spongy metal was

holding on both sides of the hole when the break occurred, the rest being a distinct progressive break which, judging from its discoloration, had existed for a considerable length of time.

Conclusions

This accident was caused by the breaking of the head rod of a switch.

According to the evidence, this switch was inspected and tested frequently, the last inspection having been made on the day previous to the date of the accident, while the signal maintainer passed over the switch only a short time before the accident occurred and noticed nothing unusual. In view of the fact that the engine and first two cars passed over the switch without being derailed it is apparent that the switch was properly lined for a main-track movement when the head end of the train encountered it, and that the points opened under the third car derailing this car and several cars following it.

An examination of this switch after the accident disclosed that the head rod was broken through the bolt hole where the switch-point shoe was attached to the rod, thus leaving the points free to move under the passing train. The broken ends of this rod showed a crack in the metal on both sides of the bolt hole which covered in all about one-half of the cross-sectional area, and the discolored condition of some of the metal indicated that a defective condition must have existed for some time. The switch point shoe, however, was twice the width of the head rod, and it covered this defect so that it could not have been detected except by removing the rod.

The evidence also indicates that there were slight marks on some of the ties for a considerable distance east of the switch and from their appearance they had been made recently by dragging equipment on a west-bound train; from the statements of the engineman and fireman, however, there was nothing dragging under the forward part of the train which remained on the track, and it was not determined that these marks had anything to do with the cause of the accident.

Respectfully submitted,

W. P. BORLAND,

Director.