

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON
THE MISSOURI PACIFIC RAILROAD AT MORTON, ARK.,
ON JULY 4, 1925.

December 21, 1925.

To the Commission.

On July 4, 1925, there was a derailment of a freight train on the Missouri Pacific Railroad at Morton, Ark., resulting in the death of one employee and the injury of three employees.

Location and method of operation

This accident occurred on the Memphis District of the Memphis Division, which extends between Memphis, Tenn., and Bald Knob, Ark., a distance of 90.51 miles, in the vicinity of the point of accident 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 accident occurred at the south switch of the passing track at Morton; approaching this point from the south the track is tangent for more than 16 miles. From a point about $\frac{1}{2}$ mile south of the point of accident the grade for northbound trains is ascending, varying from 0.1 to 0.6 per cent, being 0.48 per cent at the point of accident. The south passing-track switch is a facing-point switch for northbound trains and leads to the west or left from the main track. It is equipped with a switch-stand of the ground throw type, located on the fireman's side of a northbound train; at night a green light is displayed when the switch is lined for the main track and a red light when it is lined for the passing track. The switch is a No. 10 turnout and the switch points are 15 feet in length. The switch stand mast is located 7 feet 10 inches from the gauge side of the west rail and the center of the switch light lense is 7 feet 6 inches from the top of the head block, the stand is also equipped with switch targets, just below the switch light. The switch stand is set on two head block ties and the switch lever is about 24 inches in length, having a heavy

iron weight at its end, which acts as a handle. This lever swings in a vertical arc from one head block to the other, being secured to the lug attached to one of the head blocks when the switch is properly closed or to the lug attached to the other head block when the switch is properly open. Each lug is provided with a latch, so devised that it permits the lever to pass, and when the lever is in its proper position it is held there until tripped, by hand or foot. There is a hole in the latch for the switch lock and when the switch is properly locked the lever can not be manipulated, nor can the lever pass the latch and get out of the lug.

The track is laid with 85-pound rails, 33 feet in length, with an average of 20 white oak ties to the rail-length, and is ballasted with gravel from 6 to 8 inches in depth, tie-plates are used at switches. The track is maintained in good condition.

It was raining at the time of the accident, which occurred at about 9 57 p.m.

Description

Northbound freight train extra 43 consisted of 53 cars and a caboose, hauled by engine 43, and was in charge of Conductor Hamilton and Engineman Gammill. It left Bald Knob, 28 miles from Morton, at 8 35 p.m., and was derailed at the south passing-track switch at Morton while traveling at a speed estimated to have been about 25 or 30 miles an hour.

Engine 43, together with its tender, came to rest on its right side 250 feet from the switch, headed west, across and at right angles to the main and passing tracks. The first 10 cars were derailed, several being demolished, as was also a car which was standing on the passing track at the time of the accident. The employee killed was the engineman.

Summary of evidence

Examination of the track disclosed the first marks of derailment to be on the outside of the joint securing the west switch point; the nuts were broken off of two of the staggered bolts while the heads of the other two bolts had deep indentations, apparently made by a wheel flange. Starting at a point 2 feet 10 inches beyond the center of this joint a wheel mark 16 inches in length appeared on the outside of the base of the rail; there were

then several distinct flangemarks which seemed to merge into one set of marks on the ties, leading diagonally toward the ends of the ties for a considerable distance, indicating that all the wheel flanges followed this course. At a point approximately 45 feet from the end of the switch point several flange marks appeared on the ties and continued beyond the frog to where the track was torn up. Beginning at a point $44\frac{1}{2}$ feet north of the switch points corresponding marks appeared on the ties on the inside of the east main-track rail, these marks followed the turnout for a distance of approximately 17 feet north of the point of frog, at which point the derailed wheels came in contact with the gauge side of the west rail of the main track, this being the point where the track began to be torn up.

Fireman Perry and Head Brakeman Ward stated that when approaching this switch they were riding on their seat boxes and they noticed through the rain that the switch light was clearly displaying a green indication, before the switch was reached. Fireman Perry got down, and had just finished putting in a fire when the accident occurred. These employees said that Engineman Gammill applied the air brakes in emergency immediately after the engine derailed at the switch, and estimated the speed to have been between 27 and 30 miles an hour at the time of the accident, they also said that they did not see any one in the vicinity of the switch.

Conductor Hamilton, Middle Brakeman Smith, and Flagman Sneed were unaware of anything wrong until the accident occurred, their estimates of the speed at the time of the derailment ranged from 25 to 35 miles an hour. The conductor and flagman were riding in the caboose while the middle brakeman was on the tenth car from the head end of the train when the accident occurred. Flagman Sneed immediately went back to flag while Conductor Hamilton and Brakeman Smith went to the head end of the train, and after a delay of about 40 minutes Conductor Hamilton examined the switch and its appurtenances and found that the switch light was clearly displaying a green indication, the switch lock was locked, but the switch lever was resting on top of the latch instead of being underneath and secured by the latch. There were no marks, however, to indicate that the switch had been tampered with. There was a car standing over the switch points when he examined them and the rear wheels of this car apparently were holding the switch points in position for a main-track movement. Conductor Hamilton said that undoubtedly the switch was open when the engine encountered it, but that in an antemortem statement Engineman Gammill said everything happened so quickly he did not know what caused the derailment. Brakeman Smith also examined the switch and its appurtenances after the derailment and his

statements as to its condition at this time corroborated those of Conductor Hamilton

Division Engineer Hallsted stated that upon arrival at the scene of the accident, in company with Trainmaster Wallace, he found the switch in the same condition as described by members of the crew of extra 43. At this time he unlocked the switch lock and placed the switch lever under the latch and then locked the lock to ascertain if the lever could be worked up from under the latch, but found this could not be done. Mr Hallsted then crawled under the car that stood over the switch and observed that the main line switch point was open about 1/4 or 3/8 inch. When the cars were pulled back he again examined the opening of the switch point and found it to be 3/8 inch from the stock rail with the switch lever resting on the latch. He operated the switch several times and found that the points fitted properly against the stock rail when the switch lever was placed properly in its socket under the latch. There were no marks about the switch or its appurtenances to indicate that it had been tampered with, the only unusual condition being the lever resting on the latch instead of under it. He examined the track back to the water tank, a distance of about 3/4 mile, but found no evidence of dragging equipment. His statements in substance were corroborated by those of Trainmaster Wallace and Superintendent Williams.

Roadmaster Isard stated that he last examined the switch at about 12.40 p.m., July 2nd, at which time it worked properly and the points were in good condition. He visited the scene of the accident about 2 p.m. on the day following the derailment, and at this time found the switch in the same condition as members of the crew of extra 43 found it immediately after the accident. He noticed that the switch worked properly when the cars in extra 43 were moved and the switch points were free out, about five hours later, when the switch was thrown a number of times, the top edge of the reinforcing bar on the side of the switch point caught under the ball of the stock rail and held the point open 5/8 inch, when the bar did not catch under the ball of the rail the point closed to a 3/8 inch opening, where it was held by the switch lever resting on top of the latch. Roadmaster Isard stated that in his opinion the rail joint at the heel of the switch point became slightly low while the wrecking crew was clearing the wreckage, which condition raised the front end of the point a fraction of an inch and with the switch point sprung or twisted inward about 1/2 inch, would cause the reinforcing bar to catch under the ball of the rail.

Section Foreman Allmond stated that he examined and oiled the switch on June 30th, and at that time he operated the switch, throwing the lever from side to side, and it worked properly.

Lamp Tender Couch stated that he put oil in the lamp, trimmed the wick and lighted it again about 4 p. m., July 2nd, and at this time he noticed that the switch was closed and locked, the switch lever being in its proper place.

Numerous other employees and a merchant at Morton were questioned in an endeavor to ascertain why the switch was not properly closed when extra 43 encountered it, but their statements developed nothing of importance.

Southbound freight train extra 445 used this switch on July 2nd, about 9 a.m., to set out a car, after which Head Brakeman Kellogg, of that train, said he properly closed and locked the switch, he noticed nothing wrong with its operation.

The following day, on the northbound trip, he was riding on about the third car from the engine while passing over the south switch but at this time noticed nothing unusual; on this occasion only the north switch of the passing track was used, to pick up a car.

Northbound local passenger train No. 238 was the last train to pass over the switch, about three hours prior to the accident, at a speed estimated to have been between 40 and 50 miles an hour, and at that time none of the members of the crew noticed anything unusual.

Careful inspection of engine 43 after the accident failed to disclose any defect that would have contributed to or caused the accident.

Various switch point and switch light tests were made after the accident. In the switch point tests the flanges of the pony truck wheels of the engine used were slightly worn, apparently being somewhat thinner than those of engine 43, and the engine was operated against the switch points at a very low rate of speed. In the first series of tests the flange of the left wheel was against the rail, and it was found that with the left switch point open either $5/8$, $3/4$ or $7/8$ inch, the wheel would take the gauge side of the point; with a 1 inch opening the wheel also took the gauge side of the point but in so doing a nick about 1 inch long by $3/8$ inch deep was taken off the top of the end of the point, when opened $1\ 1/8$ inches the wheel flange struck the main track point and rode on

top of it for a distance of 25 1/4 inches before the flange dropped down on the gauge side of the point, the wheel split the switch with the point open 1 1/4 inches, going between the point and the stock rail. In a second series of tests made with the left pony-truck wheel thrown as far as possible to the right, it was not until the point was opened 1 3/4 inches that the wheel split the switch.

The switch light tests developed that with the switch open up to 1 1/8 inches no red indication was visible from a base point, 1,255 feet south of the switch, to a point 320 feet from the switch. With the switch open 1 1/4 inches a very dim green light was visible from the base point to a point 331 feet from the switch, from which latter point a little red was visible. Between this opening of 1 1/4 inches and an opening of 1 3/4 inches no light was visible at the base point, and both red and green, or either one of the other, was visible at different distances from points 977 feet to 320 feet from the switch, while with the switch open 2 9/32 inches, the lever being in the vertical position, the light was not visible until the engine was stopped 320 feet from the switch, at which point a dim green with a faint glimmer of red was visible from both sides of the cab.

Conclusions

This accident was caused by a cocked or partly-opened switch.

No defective condition was found about the track or equipment which would have caused the accident, while the switch was last used at about 9 a.m. July 2nd; Roadmaster Isard examined the switch at about 12.40 p.m., and on the same day, at about 4 p.m. Lamp Tender Couch cleaned and oiled the switch light, and at that time noticed that the switch was properly closed and locked, the lever being in the socket. Northbound passenger train No. 238 passed this point about three hours before the accident occurred, at which time nothing unusual was noticed. After the accident, however, the switch was found closed and locked but the switch lever was resting on the latch instead of being under the latch. It was not determined whether some one in possession of a switch key had closed and locked the switch without properly placing the switch lever in the socket, the vibration of passing trains causing the switch points to open, or whether the switch points were opened with malicious intent.

The tests which were made indicated that when the left switch point was open a distance of 1 1/4 inches the wheels would split the switch, it also appeared from these tests that when the switch was open to this extent the engineman of an approaching northbound train would observe only a dim green light until his train reached a point 331 feet from the switch, at which time a faint red indication was visible, the head brakeman and fireman, however, said that the switch lamp was clearly displaying a green indication as their train approached it. When making the observation tests of the lamp at the south passing-track switch it was noticed that the lamp at the north passing-track switch was displaying a bright green indication, and on account of its position on the same side of the main track, only 1,617 feet distant from the south switch, it is possible this was the indication observed by the crew of engine 43.

Had an adequate block-signal system been in use on this line this accident probably would not have occurred; an adequate automatic train stop or train control device would have prevented it.

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 law.

Respectfully submitted,

W P BOPLAND,
Director.