Inv-2358

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

MISSOURI PACIFIC RAILROAD

SHEPPARD, ARK.

JUNE 2, 1939

INVESTIGATION NO. 2358

SUMMARY

Inv-2358

Railroad:	Missouri Pacific
Date:	June 2, 1939
Location:	Sheppard, Ark.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	69
Engine number:	1543
Consist:	Auxiliary water car, 72 freight cars, caboose
Speed:	35-60 m.p.h.
Operation:	Timetable, train orders, and automatic block-signal system
Track:	Single; tangent; 0.5 percent descending grade southward
Weather:	Clear
Time:	Between 2 and 2:05 p. m.
Casualties:	3 injured
Cause:	Track kinked under train while track repair work was in progress.

Inv-2358

July 7, 1939.

To the Commission:

On June 2, 1939, there was a derailment of a freight train on the Missouri Pacific Railroad near Sheppard, Ark., which resulted in the injury of three employees.

Location and method of operation

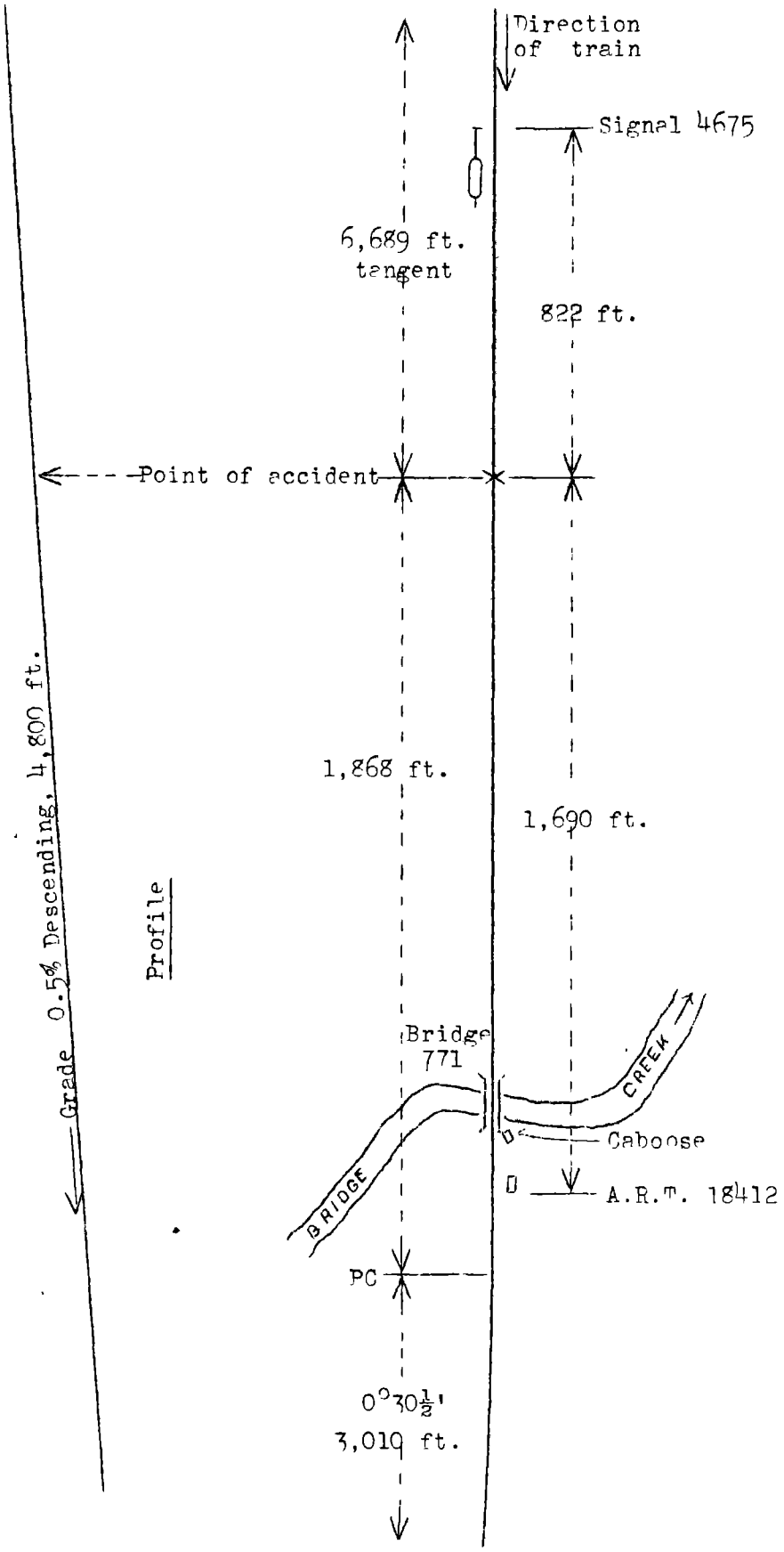
This accident occurred on that part of the Arkansas Division designated as the Little Rock District which extends between North Little Rock and Texarkana, Ark., a distance of 146.05 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders, and an automatic block-signal system. The initial derailment occurred about 1.52 miles south of Sheppard, and the final derailment occurred 1,690 feet beyond. Approaching from the north there is a tangent 6,689 feet to the point of accident and 1,868 feet beyond, followed by a 0°30'30" curve to the right 3,010 feet in length. The grade is descending southward, being 0.5 percent about 2,800 feet to the point of accident and 1,600 feet beyond, then it is practically level about 1,850 feet. The maximum authorized speed for freight trains in this vicinity is 45 miles per hour.

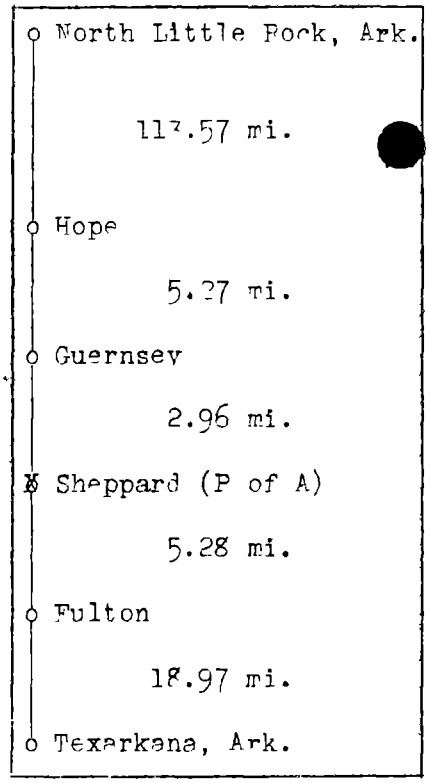
Automatic signal 4675 and Bridge 771 are located 822 feet north and 1,407 feet south, respectively, of the initial point of derailment. Bridge 771, an 8-panel reinforced concrete trestle 127 feet in length, spans Bridge Creek.

The track structure consists of 112-pound rail, 39 feet in length, laid on an average of 24 ties to the rail length; it is single-spiked, provided with 12 rail anchors per rail length, and ballasted with about 12 inches of washed gravel. At the initial point of derailment the track is laid in a cut about 1,200 feet in length, with embankments 2½ to 6 feet in height.

The 112-pound rail was new when laid in April, 1939, and replaced 90-pound rail. An extra gang was performing follow-up work from the south, which consisted of spacing and lining ties and of renewing them where necessary; in addition, tieplates were being applied. This gang had reached the track involved and had removed some of the track spikes preparatory to performing such work when the accident occurred.

The Rules and Instructions for the maintenance-of-way and structures provide as follows:





Inv. No. 2358
Missouri Pacific R.R.
Sheppard, Ark.
June 2, 1939.

"99 (e). The main track must never be obstructed without first properly displaying stop signals in both directions from the obstruction. When track is found obstructed and unsafe, or is to be made unsafe, for the passage of trains in any way whatsoever, a competent flagman having proper understanding of the use of signals must be sent in each direction with stop signals prescribed by Rule 35. After going a sufficient distance to insure protection, the distance to be determined by the surrounding conditions such as grade, curvature, weather, etc., he shall place two torpedoes on the rail on the engineman's side, two rails length apart, and take position a safe distance from the torpedoes and remain with the signals until recalled by the foreman. If a train approaches, bound in the direction of the obstruction, he shall give stop signal by hand with red flag by day and red light by night, as prescribed by Rule 12 (a).

***

"206. Slow Orders--Roadmaster and Supervisors must realize, and must bring their foremen to realize, that speed restrictions interfere with the desired movement of trains and slow orders must be placed only when required for safety. Every effort must be made to correct the conditions that make the restricted speed necessary, with the least possible delay. When no further necessity exists for a slow order it must be promptly recalled and signals removed.

"390. Laying Rails--***

In pulling spikes ahead of laying gang, great care should be exercised to preserve safety; ordinarily, to pull two, and leave one, spike on tangents and to pull every other spike on curves is safe, though the condition of ties must be taken into consideration and proper gage must be maintained."

***

The weather was clear and the temperature was about 86 degrees at the time of the accident, which occurred between 2 and 2:05 p. m.

Description

No. 69, a south-bound freight train, consisted of an auxiliary water car, 22 loaded and 50 empty cars and a caboose, hauled by engine 1543, and was in charge of Conductor McDonald and Engineman Couch. It left Hope, the last open office, at 1:38 p.m., according to the train sheet, 1 hour 58 minutes late, passed Sheppard, 8.23 miles beyond, and when nearing Bridge 771 the rear end of the train was derailed while traveling at a speed variously estimated to have been from 35 to 60 miles per hour.

The rear car and the caboose were derailed. From the initial point of derailment, at which there was a flange mark extending diagonally outward 46½ inches across the top of the east rail, ties were marked a distance of 1,407 feet to Bridge 771. The caboose toppled off the east side of the bridge and stopped on its left side on the south bank of the creek. The rear car stopped on its left side 98 feet south of the caboose, with its front end 1,690 feet south of the initial point of derailment. The employees injured were the conductor, the swing brakeman and the flagman.

Summary of Evidence

Engineman Couch stated that at Little Rock the air brakes were tested and functioned properly en route and the train handled all right. All the automatic block signals south of Guernsey, 2.96 miles north of Sheppard, displayed proceed indications. After passing Sheppard he saw the extra gang working north of Bridge 771. The track did not appear to be out of line at the point where repairs were being made; the riding condition of the track was good and he did not observe anything wrong. The first intimation he had of anything wrong was when the air brakes became applied in emergency, at which time the speed was about 40 miles per hour. He did not go back to the scene of the accident. He was familiar with the physical characteristics in this territory and he did not think there was any excessive amount of slack action down the hill which would cause the rear end of the train to run in.

Fireman Rather and Head Brakeman Boster corroborated the statement of Engineman Couch. They estimated that the speed was between 35 and 40 miles per hour. After the accident the head brakeman rode the seventy-first car into Texarkana, 24.25 miles south of Sheppard. No trouble was experienced and the air brakes functioned properly.

Swing Brakeman McLendon stated that he was in the caboose cupola with the conductor and the flagman; they were on the right side and he was on the left. The speed was about 40 miles

per hour and track riding conditions were good until the caboose reached the vicinity of the point where the extra gang was working. The first indication he had of anything wrong was when the rear end of the caboose jerked back and forth and became derailed to the east. He kicked the emergency-valve handle and thought that the valve opened; immediately thereafter the caboose plunged off the bridge. He did not observe anything wrong with the performance of the car ahead of the caboose.

Flagman White stated that from the cupola he observed the car ahead give a jerk back and forth, then the caboose gave a similar jerk and became derailed.

Conductor McDonald was so seriously injured that he could not be interrogated.

Extra Gang Foreman Trout stated that on the day of the accident he had 18 men performing follow-up track-repair work, consisting of spacing, lining and, where necessary, renewing ties, and applying plates and rail anchors. All the track was filled in with ballast. He stated that he used a jack to take the weight of the rail off the ties. Just prior to the accident he was working on a section of three rail lengths of track; within this section alternate ties were spiked except at one place where two adjacent new ties were not spiked. He was with the gang at all times and watched the spiking very closely. He saw No. 69 approaching at an unusual rate of speed for a freight train and he estimated that it was traveling at least 60 miles per hour. He did not see any movement of the rail as the train was passing over the point where track-repair work was in progress. The first indication of anything wrong was the movement of about the fourth car ahead of the caboose, and he said that the rear truck of the caboose was the first to be derailed. As a result of the derailment the caboose crowded the rail and pulled the spikes from four ties. Both rails were kinked in the same manner at three places, first to the west until the gage side of the east rail was against the center stake, then to the east, and back to the west again, and in each instance the kink measured about one and one-half rail lengths. There were several smaller kinks at points where the caboose knocked the track out of line and gage; ties were moved and spikes pulled. The rail was neither bent nor turned over and it was not necessary to replace any of it. On this day the temperature was higher than on any previous day since the follow-up work was started. Before the accident the rail was not laid too tight for safety; however, it became tight as a result of the accident. Usually about one rail length of track is opened up at a time but on this day the ballast worked easily and the tie-spacing crew got ahead of the spiking crew. He had not disturbed the track within the three rail lengths except to install new ties. He could

work eighteen men within a space of one rail length, but more work could be accomplished by working them within three rail lengths. He did not consider that the track was made unsafe by having the spikes pulled and at no time did he think that it was necessary to send out flagmen. When this follow-up repair work was started his instructions from the assistant roadmaster were to keep the track spaced, lined and filled in as close as possible, but no specific number of rail lengths was stipulated. On the morning after the accident, however, the roadmaster and the assistant roadmaster gave him instructions to pull spikes on alternate ties for not more than one rail length. A day or two after follow-up work was started he asked the roadmaster about having a slow order issued because of hot weather, but the roadmaster said it was not necessary. Following the accident the track was too tight to be straightened, so it was lined back in a gradual curve to let a passenger train by; later, when the temperature was cooler it was replaced in regular alinement without either rail being driven back. He said that before there is any movement a tight track usually makes a popping sound which is caused by the rail endeavoring to slip under the heads of the spikes, and, when movement first starts, a noise is caused by the rail jamming, but no such indications occurred in this case. He thought that even with spikes pulled from alternate ties for three rail lengths the track was good for normal speed of 45 miles per hour for freight trains. He said that in this instance the length of the freight train had considerable to do with causing the track to be kinked and that a short train of 50 to 60 cars would have passed at normal speed without incident. In his opinion the combination of the length of the train, high speed, tight track, loose ballast, and the high temperature caused the track to buckle under the rear end of the train.

Roadmaster Cranford stated that the assistant roadmaster was in charge of the extra gang on the new rail laying project and 12 miles of rail had been laid between Hope and Fulton. The roadmaster did not issue any written instructions to the extra gang foreman but he did come out on the ground and show him what to do and told him not to have more than one rail length obstructed at one time; also to organize his gang in such manner as to keep the work of digging out old ballast, spacing, spiking, plating and filling in of the track close together. Each time he went over the track he checked up on the work to see that his instructions were being carried out, the last time being about May 20. He arrived at the scene of the accident about 45 minutes after its occurrence. There was one bad kink to the west and about one and one-half rail lengths north thereof it was kinked to the east, covering a distance of about three rail lengths, making S-shaped curves. The track remained in gage and the ties to which the rail was spiked moved with the rail. The spikes were pulled from both rails on two out of three ties and at two

places within this distance of three rail lengths there were three adjacent ties with the spikes pulled. He had never before observed any gang working with as many unspiked ties as in this instance. The weather was warm enough to cause the rail to run slightly. There was no necessity to issue a slow order covering the track repair work provided it had been performed according to his instructions. The first mark of derailment was a flange mark extending diagonally outward across the top of the east rail, then marks appeared on the ties outside the east rail and inside the west rail and led toward the east, apparently being made by the rear truck of the caboose. A short distance farther south other similar marks appeared, apparently being made by the forward truck of the caboose. The ties were marked as far as the east guard rail of Bridge 771. He thought that the caboose plunged off the bridge and then pulled the rear car off the track. In his opinion the reason that the kink occurred was because too many spikes had been pulled out of the ties which caused the rail to work out.

Assistant Roadmaster Morgan stated that the extra gang foreman had instructions to work the men close together, not to disturb too much track at one time, and to pull spikes from only alternate ties within one rail length. He checked the follow-up work almost every day to ascertain whether it was being done in accordance with instructions, and the last check was made on the day before the accident. He did not see the extra gang at any time on the day of the accident before the derailment occurred. On arrival at the scene of the accident about 2 hours after its occurrence he found conditions to be as described by the roadmaster. Between the time of the occurrence of the accident and the time of his arrival at the scene thereof, it appeared that some work had been done on the track; at this time the spiking was not in accordance with instructions. Considering existing weather conditions and provided the track had been properly secured and not more than alternate ties left unspiked, he did not think that the defect in alinement would have occurred. He thought that during the course of work the gang might have put the track slightly out of line; this condition combined with too many spikes pulled, a small sun kink, and the action of the freight cars moving over the track contributed in the developing of the kink and caused the accident.

Division Engineer Jaeschke arrived at the scene of the accident about 9 hours after its occurrence. Before that time the track had been placed in proper alinement. Inspection was made for about one mile north of Bridge 771 to check expansion, but no tight rail condition was found. The marks on the ties indicated that there had been a sun kink at the point of accident; however, as there was no tight rail condition the sun kink would not have occurred unless an insufficient number of ties were spiked.

Temperature readings at Hope for June 2 showed that at 2 p. m. it was 84 degrees, and that sometime between 10 a. m. and 2 p. m. it was 87 degrees.

On arrival at Texarkana after the accident, inspection was made of engine 1543 and the cars in No. 69; inspection also was made of the caboose and the rear car; no defect was found that would have contributed to or caused the accident.

Observations of the Commission's Inspectors

When the Commission's inspectors arrived at the scene of the accident the track had been lined, repaired and the follow-up work completed for a distance of 243 feet north of the point of derailment. They found the marks of derailment substantially as previously described.

Inspection of the track for one-half mile north of the point of accident, and of the caboose and the rear car, did not develop any condition that would have contributed to or caused the accident.

Discussion

According to the evidence, an extra gang composed of a foreman and eighteen men were working northward on a 0.5 percent descending grade for south-bound trains, doing follow-up track-repair work, which consisted of spacing and lining ties, renewing them where necessary, and installing rail anchors and tieplates. The weather was clear and the temperature was about 86 degrees. When the caboose was passing over the track involved the track buckled to the west about two feet, then to the east, and again to the west, each kink being about 60 feet in length.

The foreman said that he usually opened the track about one rail length at a time, but in this instance the ballast worked easily with the result that the spacing crew got ahead of the spiking crew and three rail lengths of track were opened up. The roadmaster and the assistant roadmaster said that they had given the foreman verbal instructions to work only one rail length at a time but the foreman said that he had not received such instructions. The maintenance-of-way and structure rules do not specify a definite length of track that may be opened up. Had the roadmaster and the assistant roadmaster issued written instructions instead of verbal ones this controversy probably would not have occurred. The track involved was tangent. Rule 390 is to the effect that in opening up track on tangents it is safe to pull the spikes from two ties and leave the third tie spiked, the condition of the ties to be taken into consideration.

According to the foreman the spikes had been drawn from only alternate ties except in one place where there were two adjacent new ties unspiked. On the other hand, the roadmaster and the assistant roadmaster stated that when they arrived at the scene of the accident they found two places where three adjacent ties were not spiked; the roadmaster said that only every third tie was spiked; however, the evidence was to the effect that the track was considerably disturbed during the derailment, some spikes being pulled as a result of the derailment, and it is possible that spikes were pulled from some of the ties in the two places referred to by the roadmaster and the assistant roadmaster.

The crew of No. 69 estimated that the speed of their train at the time of the accident was from 35 to 40 miles per hour. The foreman said that the speed was more than 60 miles per hour. According to the evidence the train consumed not less than 22 minutes from Hope to the point of accident, an average of 26.6 miles per hour. The foreman also said that he had asked the roadmaster about having a slow order issued to cover the follow-up work, but the roadmaster did not deem it necessary. The foreman thought the condition of the track just prior to the accident did not require flag protection.

Apparently the track was tight because of expansion resulting from moderately high temperature. The washed gravel ballast, which does not offer as much resistance to track movement as some types of ballast, had been loosened in this track-repair work which would cause it to be still less resistant. Alternate ties being unspiked would lessen the resistance against lateral movement of the rails. No doubt these conditions combined with the movement of the train on the descending grade caused the track to buckle.

Conclusion

This accident was caused by the track kinking under the train, resulting from the movement of the train over tight track which had been disturbed during track-repair work.

Respectfully submitted,

W. J. PATTERSON,

Director.