

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC RAILWAY, SOUTHERN RAILWAY SYSTEM, AT DANVILLE, KY., ON APRIL 10, 1928.

May 11, 1928.

To the Commission :

On April 10, 1928, there was a rear-end collision between a passenger train and a light engine on the Cincinnati, New Orleans & Texas Pacific Railway, Southern Railway System, at Danville, Ky., resulting in the death of 1 employee, and the injury of 17 passengers, 3 employees, 2 Pullman porters and 1 dining car employee.

Location and method of operation

This accident occurred on that part of the Queen & Crescent District extending between Somerset and Danville, Ky., a distance of 44.4 miles; in the vicinity of the point of accident this is a double-track line over which trains are operated by time-table, train orders and an automatic block-signal and automatic train-control system. The accident occurred within yard limits at Danville, at the south end of what is known as the north yard, on the lead track at yard track 2; the lead track branches off the northbound main track toward the northeast, while yard tracks 1, 2, 3, and 4, numbered from west to east, extend northward from the lead track. Yard track 2 connects with the lead track at a point 297.4 feet from the switch connecting the lead track with the northbound main track, this being the main-track switch involved in this accident. At a point 18 feet south of this main-track switch there is another switch, the north switch of a crossover, which connects the two main tracks; the crossover is 201 feet in length. Approaching from the south the track is tangent for a considerable distance, followed by a compound curve to the left about 2,000 feet in length, the lead-track switch involved being located on this curve at a point approximately 288 feet from its northern end, where the curvature is at its maximum of 2°. The grade for northbound trains is approximately 1 per cent ascending at the point of accident.

The signals involved are northbound signals 1172 and 1176, located 557 and 2,430 feet, respectively, south of the lead-track switch. Signal 1172, mounted on a bracket pole, is of the upper quadrant, semaphore type and operates

in the stop and caution positions only; there is a lower arm on this signal which governs movements to the yard. Signal 1176 is of the three-position, upper-quadrant, semaphore type, this signal displays a clear indication when the block it governs is clear and signal 1172 is in the caution position. The automatic **train-control** device is of the intermittent inductive type, known as the auto-manual automatic stop, manufactured by the General Railway Signal Company. The apparatus includes a forestalling device, by means of which an engineman receiving a restrictive signal indication may forestall the operation of the automatic train stop; this is accomplished by operating a small lever as the locomotive receiving apparatus passes over the track inductor which, at signal 1172, is located 48 feet in the rear of the signal. This inductor is not wound and consequently gives an automatic stop impulse whenever an equipped locomotive passes it, regardless of the indication of the signal.

The two switches involved are of the ball-throw type, the switch-stands, 28 inches in height, being located on the east side of the northbound track. The switch-stands are provided with lamps, but there are no target blades to indicate the position of the points by day.

At the time of the accident light engine 1307, headed north, stood on the lead track with the rear end of its tender fouling yard track 2; the switch leading from the lead track to yard track 2 was lined for that yard track. Work extra 6272, consisting of engine 6272, headed north, six cars and a caboose, stood on the southbound main track, opposite northbound signal 1172, the head end of the engine being about 100 feet south of the south crossover switch and the rear end of the caboose about 100 feet south of the signal. In the immediate vicinity of the point of accident there are yard tracks on each side of the main track upon which cars are left standing; engines are constantly working in this vicinity, and there are a number of buildings near the tracks. Due to these conditions the view of signal 1172 at the time of the accident was restricted to about 592 feet from the engineman's side of the cab of a northbound engine.

The weather was clear at the time of the accident, which occurred at about 5.15 p. m.

#### Description

Northbound passenger train No. 42 consisted of one express car, one combination car, one coach, one Pullman car, one dining car, and one Pullman observation car, all of steel construction, hauled by engine 6465, and was in charge of Conductor Varner and Engineman Bradley. This train left Somerset at 4.15 p. m., according to the train sheet, 10 minutes late, left Junction City, 4.3 miles south of Danville, at 5.08 p. m., according to the train sheet, five minutes late, passed signal 1176, which was displaying a clear indi-

caution, passed signal 1172, the indication of which is in question, entered the main-track switch leading to the south end of the north yard, this switch having just previously been opened by Brakeman Paul of work extra 6272, and struck the rear end of the tender of light engine 1307 while traveling at a speed variously estimated to have been from 20 to 40 miles per hour.

Engine 1307 was driven ahead on the lead track and came to a stop with its head end about 275 feet north of the switch leading to yard track 2, the tender cistern was torn from the frame and came to rest across yard track 3. With the exception of the rear truck of the combination car none of the equipment of train No. 42 was derailed; however, train No. 42 separated in two places, there being a space of 80 feet between the tender and the first car and a space of 40 feet between the second and third cars when the equipment came to a stop. The front end of engine 6465 was damaged and the engine and tender came to a stop on yard track 2, the rear end of the tender being about 110 feet from the lead track switch. The employee killed was a hostler helper on engine 1307.

#### Summary of evidence

Engineman Bradley, of train No. 42, stated that approaching Danville he received a clear indication at signal 1176 and as he approached signal 1172 it was in caution position; these indications were also called by the fireman. Approaching signal 1172 he made an air-brake application and when the engine was about one car-length from signal 1172 he released the brakes, the speed having been reduced to about 30 or 35 miles per hour; he operated the acknowledging lever to acknowledge the caution signal indication and forestall the operation of the automatic stop. He then sounded a crossing whistle signal and the first knowledge of anything wrong which he had was when he felt the engine swerve as it entered the open switch, he immediately applied the air brakes in emergency but thought the speed had not been further reduced, at least to any extent, prior to the accident. Engineman Bradley at first said that his engine was about four or five car-lengths south of signal 1172 when he remembered looking at it the last time; he said that the signal indication could have changed to stop if the switch was opened between the time he last saw the signal and the time the engine passed it, but the time was very short and he was of the opinion that the main-track switch was not opened until after his engine passed signal 1172. Engineman Bradley later said that signal 1172 displayed a caution indication when he started to move the forestalling lever down while the engine passed over the track inductor. On account of the curve his view of the switch was obstructed until he had nearly reached it, and he did not see Brakeman Paul open it.

The statements of Fireman Padgett corroborated in

substance those of Engineman Bradley; he said he was looking ahead across the inside of the curve and continued to watch the caution indication displayed by signal 1172 until his own engine hid it from view, when about 200 feet from the signal. He estimated the speed of his train to have been about 35 miles per hour when passing signal 1172 and about 30 miles per hour when entering the open switch. Fireman Padgett was of the opinion that the switch was opened after his engine passed signal 1172. He did not look at the switch as his train approached it.

Conductor Varner, Baggage-master Silvers, Flagman Combs and Train Porter Owens were unaware of anything wrong until the air brakes were applied in emergency just prior to the accident; their estimates of the speed approaching Danville yard ranged from 25 to 30 miles per hour and at the time of the collision from 20 to 30 miles per hour. Flagman Combs immediately went back to flag and on his way back he observed signal 1172 displaying a stop indication.

Conductor Kidd, of work extra 6272, stated that when his train departed from Danville to work on the southbound main track south of that point he left Brakeman Paul at Danville with instructions to hold all trains until work extra 6272 returned; and when he saw the train returning to call up the yardmaster and find out where he wanted to put the train. He did not give him any instructions concerning train No. 42 as he was an experienced and qualified man and was fully informed as to what was required of him. When his train returned to Danville just prior to the accident it stopped with the caboose on the southbound main track just south of signal 1172; he was in the cupola of the caboose, on the east side, and watched train No. 42 as it approached. He estimated the speed of that train to have been about 40 miles per hour when it passed signal 1172. Conductor Kidd said that signal 1172 was displaying a caution indication as the engine of train No. 42 passed it, he saw the engine pass the signal before the indication changed and that immediately afterwards the indication changed to stop. Brakeman Paul could have opened the main-track switch at the time the engine passed the signal, or afterwards, but regardless of what caused the indication of signal 1172 to change from caution to stop he was positive that it changed just as the engine passed it. Conductor Kidd further stated that when passing from one track to another it must be known that first-class trains have arrived, and that the brakeman opens the switches if he knows the track is clear. After his train returned to Danville, he did not see Brakeman Paul before the accident occurred.

Brakeman Newell, of work extra 6272, who was riding on the caboose, stated that as his train was brought to a stop he saw train No. 42 pass signal 1176, which was displaying a clear indication; he did not observe the position of

signal 1172. He estimated the speed of train No. 42 to have been about 40 miles per hour when it passed the caboose.

Engineman Davis, of work extra 6272, stated that as his train approached signal 1172 on the return trip, northward, to Danville against the current of traffic on the southbound main track, he observed that signal in the caution position, just before his train reached it. When he brought the train to a stop just south of the crossover the fireman got out of the engine cab to take down the signals, while the engineman shut off the lubricator; the engineman did not observe signal 1172 again prior to the accident. He saw a man, who he later learned was Engineman Strunk, at the south crossover switch, but he did not see Brakeman Paul prior to the accident. When Engineman Davis first saw train No. 42 approaching, the engine of that train had passed signal 1172 and Engineman Davis said that just as Fireman Hogue climbed back into the cab of the work train engine, train No. 42 passed at a speed of about 35 or 40 miles per hour.

Fireman Hogue, of work extra 6272, stated that when his train stopped on the southbound main track after making the return movement he got down from his side of the engine and went out to take down the signals on the engine. While standing on the pilot of the engine he saw Brakeman Paul lining the switches, working briskly, and he assumed he had gotten time on train No. 42. Fireman Hogue then got down off the pilot, walked on the northbound main track back to the engine cab, climbed up into it and at about this time he heard train No. 42 approaching. He said that he just happened to see signal 1172 when he was climbing up into the cab and it was displaying a stop indication; at that time train No. 42 was not in sight, but it passed his engine about half a minute later and he thought train No. 42 must have passed signal 1172 while that signal displayed a stop indication. Knowing that the brakeman had opened the switch, he thought train No. 42 was going to be derailed and he said something about it to Engineman Davis. Engineman Davis, however, said this was after the accident had occurred.

Brakeman Paul, of work extra 6272, stated that when his train left Danville he remained there with instructions to flag all trains until the return of his train. When he saw the work train returning to Danville Brakeman Paul called the yardmaster by telephone and received instructions to put the work train on the coal track in the north yard; nothing was said about train No. 42 and he did not tell the yardmaster his train was on the southbound track. He immediately left the telephone booth and walked about 50 feet to the switch connecting the northbound main track with the lead track and opened it, then he walked to the north switch of the crossover, 18 feet south, and opened that switch, after which he started toward the south switch of the crossover, intending to open that switch. After reaching a point about 30 feet south of the north switch of the crossover he saw train No. 42

approaching, at which time he said it was north of signal 1172. Brakeman Paul immediately started running north between the rails of the southbound main track, in an attempt to reach and close the switch leading from the northbound main track to the lead track; but train No. 42 passed him, and then the accident occurred. Brakeman Paul said that these switches are not equipped with switch indicators and that he did not see the indication displayed by signal 1172 at any time. From the time he left the telephone booth and opened the switches until the time he first saw train No. 42 approaching he walked briskly but did not run; the switches were latched but not locked. Brakeman Paul said that he had entirely overlooked train No. 42, although he had a time-table and a standard watch. He further stated that the rules require employees to know the time passenger trains are due before crossing over from one main track to another; but said that he did not think about train No. 42 at all, and that being on the other track was what caused him to overlook that train. He admitted his responsibility for the accident.

Engineman Strunk, who had just gone off duty, and Roundhouse Foreman Hodges were standing east of the northbound main track and just opposite the south crossover switch when Brakeman Paul came out of the telephone booth and started toward the switches. They thought Brakeman Paul had received time on train No. 42 which was then due, as he opened the main-track switch and the north crossover switch, and then started toward the south crossover switch; Engineman Strunk started to open the latter switch for him. About that time they saw train No. 42 approaching, at a speed of about 35 miles an hour, north of signal 1172, and although both Brakeman Paul and Engineman Strunk ran toward the main-track switch it was then too late to avert the accident. They did not see signal 1172 and did not know whether Brakeman Paul opened the switch before or after train No. 42 passed the signal but said that the train must have been close to the signal when the switch was opened.

Other witnesses testified that while they did not see signal 1172 they did see train No. 42 approaching, north of the signal, within a short period of time, the estimates varying from 10 to 30 seconds, after Brakeman Paul opened the switch involved.

Two different tests were made to determine as closely as possible the length of time it took Brakeman Paul to open the main-track switch and the north crossover switch, and then to start toward the south crossover switch as he described his movements on the day of the accident. In the first test it required 24 seconds and in the second test 19 seconds; in the second test Brakeman Paul did not take as many steps southward as he did in the first test.

Tests of the automatic train-control mechanism and

the signals, made subsequent to the accident, disclosed them to be operating as intended; a period of four seconds was required from the time the main-track switch was opened until signal 1172 started to move from caution to stop and two seconds additional to complete the movement of the signal.

#### Conclusions

This accident was caused by a switch being opened directly in front of train No. 42, for which Brakeman Paul of work extra 6272 is responsible.

Train No. 42 was due at Danville at 5.10 p. m., and at the time the switch was opened it was already over-due at that point. Under the rules the work extra was required to clear the time of train No. 42, a first-class superior train, and Brakeman Paul should not have opened the switches in preparation for the movement of the work extra from the southbound track to the northbound main track and thence to the yard, without first knowing either that train No. 42 had passed or that his train had been given additional time on train No. 42. Brakeman Paul had had about five years' experience and was fully aware of these requirements, but he failed to conform to them, as he admitted that he entirely overlooked train No. 42. Because of his action in this instance he is directly responsible for this accident.

This accident occurred on a line equipped with automatic block signals and an automatic train-control device and it was an accident of a type which these devices are designed to prevent. Signal 1172 is located only a short distance from the entrance to Danville yard and less than 1 mile from Danville Station, this signal displays only caution and stop indications and the automatic stop inductor installed in connection therewith is so arranged that an automatic operation of the brakes will occur whenever an equipped engine passes it, regardless of the indication of the signal, unless the forestalling device is operated by the engineman.

There is conflicting evidence as to the indication of signal 1172 at the time train No. 42 actually passed it. It is clearly shown to have been in caution position at the time train No. 42 approached it and according to the statements of the engineman and fireman of train No. 42, it was in caution position the last time they saw it just before passing it. Conductor Kidd of the work extra was watching train No. 42 as it passed and saw the signal change from caution to stop just as the engine passed under it. Fireman Hogue of the work extra, however, stated that signal 1172 was in the stop position before train No. 42 came into his range of vision and he thought train No. 42 must have passed the signal in the stop position. However, Engineman Davis of the work extra said that train No. 42 passed just as Fireman Hogue came back into the cab, the time when Fireman Hogue said he saw signal 1172 in the stop position, and in that

event train No. 42 must have already passed signal 1172. Conductor Kidd was in a more favorable location for observing the signal at the time the train passed it and he was positive in his statement that it changed from caution to stop just as the engine passed under it. Had the switch been opened more than five or six seconds before train No. 42 passed signal 1172 that signal would have displayed a stop indication, which under the rules would have required the train to stop before passing it. Had this signal been in stop position for train No. 42, this train probably could have been stopped before reaching the open switch, either by the operation of the automatic train stop, if the engineman did not forestall, or by operation of the brakes by the engineman. With the signal in caution position, however, the engineman after acknowledging the signal indication and thereby forestalling the automatic application of the brakes was permitted to proceed to the next signal prepared to stop. From the evidence in this case it is believed that the switch was opened just as or immediately after train No. 42 passed signal 1172, the last indication point. The signal therefore gave no indication, before train No. 42 passed it, of the dangerous condition which was created by the opening of the switch only a short distance ahead, and there was, under the circumstances, no opportunity for the train stop device to perform its intended function. Both the signal and the train stop device were found, upon test, to be operative as intended.

Brakeman Paul was employed as a brakeman in February, 1923, and his record was good. All of the other employees involved were experienced men and 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.