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IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE SOUTHERN RAILWAY AT SALISBURY, N. C., ON NOVEMBER 24, 1915.

On November 24, 1915, there was a rear-end collision between two passenger trains on the Southern Railway at Salisbury, N. C., which resulted in the death of 2 passengers and injury to 35 passengers and 3 mail clerks. After investigation the Chief of the Division of Safety submits the following report:

The accident occurred on the Salisbury Terminal Division of the Southern Railway. The line is double track; the movement of trains if governed by time-table, train orders and automatic block signals; train orders being transmitted by telegraph.

Beginning at a point about 1.7 miles south of Salisbury station and proceeding northward, the track is tangent for 6,500 feet; this tangent is followed by a 2-degree curve to the left 625 feet in length; the track is then tangent for 1,450 feet to Salisbury station. The first signal involved is signal 3350, which is a one-arm, three-position, upper right-hand quadrant signal and is located on the first mentioned tangent about 1,000 feet from its south end. Proceeding northward, the next signal, No. 3370, a two-arm signal of the same type, is located 5,650 feet farther north and on the curve, 250 feet from its south end. At a point 1,120 feet north of signal 3370, is located a facing point crossover leading from the northbound track to the southbound track and thence to several station tracks adjoining on the left. The accident occurred at a point 350 feet south of the south point of

this crossover and 573 feet north of signal 3370. The track at this place extends through a cut about 12 feet in depth which is spanned by three highway bridges, the most southerly one being at Bank Street, located 10 feet south of the point of collision. At the point of the accident there is a grade of 0.46% descending northward.

Northbound passenger train 2nd No. 38, en route from Charlotte, N. C., to Richmond, Va., consisted of engine 1219, 5 coaches, Pullman sleepers Amerburst, Selena and Ophir, and was in charge of Conductor Laird and Engineman Jones. It left Charlotte at 8:10 p.m., 25 minutes late, passed China Grove, the last station, 9.4 miles south of Salisbury at 9:16 p.m., 36 minutes late. Approaching Salisbury, signal 3360 was found in a caution position, and signal 3370 with the top arm in the stop position and the bottom arm in the caution position. Approaching the crossover the train was given a signal to stop by a switchtender stationed at that point, and the train stopped at 9:30 p.m., with the engine about 20 feet south of the crossover switch. After waiting a few minutes for a southbound train to pull out of the station and pass on the southbound track, 2nd No. 38 started forward and after proceeding about 30 feet, it was again stopped by a hand signal from the switchtender. The train was standing at this point with its rear end at the north end of the curve when it was struck by train No. 36 between 9:36 and 9:37 p.m.

Northbound passenger train No. 36, en route from New Orleans, La., to Washington, D. C., consisted of engine 1,333, postal car, club car, dining car and Pullman sleeping cars Invanpat, Evington, Hazelhurst, Bromholm and Glenalpin, and was in charge of

Conductor Tucker and Engineman Tankersley. It left Charlotte at 9124.
6:31 p.m., one minute late, and passed China Grove at ~~XXXX~~ one minute late. The train passed signal 3360 in the caution position and signal 3370 with the top arm in the stop position, and the lower arm in the the caution position, and while running at a speed estimated to have been between 6 and 15 miles per hour collided with the rear of train 2nd No. 32. The weather at the time of the accident was clear.

The force of the collision drove train 2nd 32 forward about 30 feet. The locomotive of train 38 telescoped sleeping car Ophir for about 20 feet and drove its rear truck forward to the center of the car. The front end of engine 1,353 was slightly damaged. Neither the engine nor any of the cars were derailed.

The automatic block signals by which this territory is protected were installed in February, 1913. The standard signal is one-arm, three-position, upper right-hand quadrant type, using at night white, green and red lights for clear, caution and stop indications, the lamps being electrically lighted, but without back lights.

Signal 3360 is a one-arm automatic signal displaying standard indications. Signal 3370 is a two-arm signal; the top arm gives the usual indications and a train using the straight or freight track will get the usual clear, caution, or stop indication as with any other automatic signal; in such a case the lower arm remains in the stop position and the meaning of the top arm is in no way different from that of any of the one-arm signals.

The second arm of signal 3370 is for the purpose of in-

dicating to approaching trains that the crossover switch, located 1,120 feet farther north, has been opened. This second arm gives a caution and a stop indication only and is controlled in no way by the track circuit.

If the crossover switch leading to the station is open the top arm, as with any automatic signal when the main track is broken, takes the stop position and the lower arm will assume the caution position.

The following aspects are presented, therefore, by this signal under various conditions:

1st. Both arms stop, block obstructed, but crossover switch not open.

2nd. Top arm caution, lower arm stop, first block block clear, second block obstructed.

3rd. Top arm clear, lower arm stop, next two blocks clear.

4th. Top arm stop, lower caution, indicating that switch is set for the station, but that the block may or may not be occupied by trains between the signal and the crossover switch.

The use by trains of signal 3570, when displaying the latter indication is governed by special time-table rule 603 which reads in part as follows:

"Signal 3570 just south of the passenger station at Salisbury is provided with two arms, the upper arm governing through movements on main track. The lower arm when in the 45-degree or caution position indicates that the main line switches are set for one of the diverging tracks into the station. Enginemen will proceed with caution, prepared to stop within the limits of their vision."

On June 23, 1913, the following bulletin was posted on bulletin boards:

All Engineers:

I have recently noticed some of the passenger engineers approaching passenger station at Spencer and Salisbury at too high a rate of speed. Will you please use the necessary precaution in the future?

R. L. Avery,

Supt. of Terminals.

On October 6, 1913, another bulletin was posted, reading as follows:

All passenger engineers:

I have recently noticed some of the engineers are running at too high a rate of speed while approaching passenger station at Salisbury and Spencer. I have called your attention to this several times. I want you to use extra precaution while approaching the passenger station and crossover switches at Salisbury.

R. L. Avery,

Supt. of Terminals.

The latter bulletin bears Engineman Tankersley's signature.

Pullman sleeping car Ophir, the rear car of train 2nd No. 38, was built in 1892. The car was of wooden construction with steel sheathing and was equipped with six-wheel steel trucks.

Engine 1,333 on train 38 is of the Pacific type, having a total wheel base of 67 feet. It is equipped with Westinghouse high speed E. T. brakes, two 9-1/2-inch pumps and is provided with an electric headlight.

With a view to ascertaining the vision of the engine crew of a train approaching the point of accident, a car with markers was placed in the position occupied by the rear of train 2nd 38 at the time of the accident, and under similar conditions, and it was found that the markers could easily be seen from the engineman's seat a distance of about 320 feet and for a distance of about

1,400 feet from the fireman's seat.

Engineman Jones, of train 2nd 33, stated that on approaching signal 3370, he found the top arm in the stop position and the bottom arm in the caution position, which indicated to him that the block was occupied and that the crossover switch was set in position for the station tracks. He reduced the speed of his train and brought it to a stop at 9:29 or 9:30 p.m., just south of the crossover switch. At this point his train waited until train No. 35 had pulled out of the station and passed on the southbound track; he then started his train forward a few feet but was stopped at the point of the crossover switch by a hand signal from the switchman. He stated that he expected a signal to proceed would be given at any moment and he was in the act of reaching for the whistle cord to signal the flagman to go back, when the collision occurred. He stated that as soon as he straightened up after the collision, he looked at his watch and it was then 9:37 p.m. Engineman Jones stated that he does not consider the stop which his train made at the crossover an unusual one and he has been stopped there a number of times in order to permit other trains to get out of the station. He also stated that he has on some occasions found the track occupied between signal 3370 and the crossover.

Conductor Laird, of train 2nd 33, stated that approaching Salisbury, he was riding in the second car from the engine and that when the train stopped south of the crossover at 9:29 or 9:30 p.m., he opened the window and looked out. He then went to the platform, got off, and asked the brakeman, who was there, if he had seen the flagman go back, the brakeman replying that he had not. Conductor

Laird stated that after waiting a few minutes he started to go back to the rear of the train and when about two car lengths from the rear, saw the flagman standing with his lantern, whereupon he shouted to him to back and flag. He stated that the flagman stepped upon the platform, got his lanterns and started back, making the remark that train No. 38 was not due until 9:40 p.m., to which Conductor Laird replied, "Go back any way." Conductor Laird then started toward the forward end of the train. After walking a short distance, he turned and saw the reflection of the headlight of train No. 38 on the rails; he then returned to the rear of the train and was at that point when the accident occurred. He stated that his train had been standing three or four minutes before the flagman started back and that he had reached a point 300 or 400 feet from the rear of the train when he was passed by train No. 38. He stated that this flagman has been working with him regularly for five or six months and he considers him to be a competent flagman. He further stated that the brakes on train No. 38 were not applied until the engine was within 100 feet from the rear of train 2nd 38 and he estimates the speed of train No. 38 to have been 18 or 20 miles per hour at the time the accident occurred.

Flagman Wilson, of train 2nd 38, stated that shortly after leaving China Grove, he went to the forward platform of the rear car and had been riding there 4 or 5 minutes when the train stopped south of the crossover; upon stopping he looked out to see the cause and then passed through the car to the rear platform, opened the trap and got off; about the time he got on the ground the conductor shouted to him to go back with a flag, whereupon he returned to the rear platform, secured his red lantern and started

to run back swinging the stop signal and had proceeded about 500 feet when he was passed by the engine of train No. 38. At the time he started to go back he could see the rays of the headlight of train No. 38 shining on the rail. He stated that he was not riding on the rear of the train as several passengers were occupying the platform and the reason that he did not go back immediately was because he expected every moment the train would move forward. He stated that the train stopped at 9:30 p.m. and the collision occurred at 9:38 p.m.; that his train had been standing about 3 minutes when he started back to flag and he believes that if he had gone back immediately when the train stopped he would have had an opportunity to get back a sufficient flagging distance, but considering the speed at which train No. 38 was running he probably would not have succeeded in stopping it. He estimates the speed of train No. 38 to have been 30 or 35 miles per hour at the time it passed him. He further stated that he knew train No. 38 was due to arrive at Salisbury at 9:40 p.m., and feels that it was his duty to flag at this point.

Engineman Tankersley, of train No. 38, stated that his train passed China Grove at 9: 4 p.m., one minute late; as he approached signal 3380, it was in the caution position and he reduced the speed of his train; when about half a mile from signal 3370, he saw the top arm of that signal in the stop position and the bottom arm in the caution position; passing the signal, he released the brakes, and at that time the speed of his train was about 12 or 15 miles per hour; when he had reached a point about 200 feet south of the overhead bridge, he discovered the flagman and the rear of train No. 39 simultaneously; at that time the flagman was in

the middle of the track and between 50 and 70 from the rear of the train.
He immediately applied the brakes and reversed the engine. Engineman Tankersley further stated that it has always been his understanding that when the bottom arm on signal 3370 was in the caution position and the top arm in the stop position, it indicated that the crossover switch was open, the track was clear as far as the switch, and that it gave him a right to pass the signal at a reasonable rate of speed so that he could stop, in case a stop signal should be given. He stated that in this instance he could have stopped within his range of vision except on that particular curve.

Fireman Kelly, of train No. 38, stated that approaching Salisbury he was sitting on the fireman's seat looking ahead for signals. He saw signal 3370 with the top arm in the stop position and the bottom arm in the caution position, but did not see the flagman or the rear of train 2nd 32 until the engineman applied the brakes.

The direct cause of this accident is the failure of Flagman Wilson properly to protect the rear of his train.

General rule 99, reads in part as follows:

> "When a train is stopped at an unusual point or is delayed at a regular stop over three minutes, or when it fails to make its schedule time, the flagman must immediately go back with danger signals to stop any train moving in the same direction."

Under this rule Flagman Wilson should have gone back as soon as the train stopped and not have waited until after three minutes had elapsed before making any attempt to protect the rear of his train. Had he gone back immediately he probably would have reached the

point of tangent where his stop signal could have been seen a considerable distance and thus warned train No. 38 of the presence of train 2nd 32.

Contributing to the accident is the failure of Engineman Tankersley to have his train under control upon passing signal 3370, as required by the second paragraph of special time-table rule 603. Under that rule Engineman Tankersley should have so controlled the speed of his train, after passing signal 3370, that his train could have been stopped at any point within the range of his vision, should any obstruction have been found upon the track.

Fireman Kelly shares in the responsibility for this accident, in that he was seated on the fireman's seat looking ahead and in that position he should have seen the markers of train 2nd 32 a sufficient distance to have warned the engineman and given him ample time in which to stop the train.

Flagman Wilson entered the service of the Southern Railway March 15, 1907, and has a clear record.

Engineman Tankersley entered the service of the Southern Railway as fireman October 1., 1903, and was promoted to engineman August 15, 1904.

Fireman Kelly entered the service April 18, 1910, and has a clear record.

At the time of the accident, Flagman Wilson had been on duty 2 hours, and Engineman Tankersley and Fireman Kelly had been on duty 9 hours in the aggregate in the preceding 24-hour period.

Attention has repeatedly been called to the superiority

of all-steel equipment in passenger trains, and had sleeping car Ophir been of all-steel construction the loss of life and the number of injuries which resulted from this accident would undoubtedly have been much less.