

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE
SOUTHERN RAILWAY SYSTEM, LINES EAST, AT LANDIS, N.C.,
ON JANUARY 21, 1929.

April 16, 1929.

To the Commission:

On January 21, 1929, there was a head-end collision between two freight trains on the Southern Railway System, Lines East, at Landis, N. C., resulting in the injury of one employee.

Location and method of operation

This accident occurred on that part of the Piedmont District of the Charlotte Division extending between Salisbury, N. C., and Greenville, S. C., a distance of 150.4 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 train-control system. The accident occurred on the southbound main track at a point about 150 feet south of the south switch of a crossover; approaching from the north there is a 2° curve to the left 926 feet in length, followed by about 1,865 feet of tangent to the point of accident, this tangent extending for some distance beyond. The grade for southbound trains is ascending for a distance of about 4,550 feet, the maximum gradient being 1.07 per cent, from which point it is practically level to the point of accident, a distance of approximately 550 feet.

The crossover is a trailing-point crossover 196.5 feet in length, connecting the two main tracks. The signals involved, of the color-light type, are southbound signals 3439 and 3451, located 9,637.5 feet north and 733.5 feet south, respectively, of the south switch of the crossover. Indications are red, yellow and green, for stop, caution and proceed, respectively. The switches of the crossover operate in conjunction with the automatic block-signal and train-control system. Under the rules when a train crosses over to, or obstructs the other track, it must first be protected in both directions as prescribed by rule 99, unless otherwise directed, and before entering the main track in automatic block-signal limits a train must in addition to other precautions wait two minutes after opening the switches before proceeding.

The weather was clear at the time of the accident, which occurred at about 6.55 p.m.

Description

Northbound third-class freight train No. 62 consisted of 23 cars and a caboose, hauled by engine 4848, and was in charge of Conductor Gordon and Engineman Julian. On arrival at Landis it was brought to a stop on the northbound main track with the caboose just north of the crossover. A back-up movement was then made through the crossover to the southbound main track, in order to perform work and to allow a following first-class train to pass, train No. 12, due at Landis at 7.04 p.m., and the train was still backing up, at a speed estimated to have been between 6 and 8 miles per hour, when its head end was struck by train No. 55.

Southbound second-class freight train No. 55, consisted of 38 cars and a caboose, hauled by engine 4884, and was in charge of Conductor Barton and Engineman Roper. This train left Salisbury, the last open office, 11.9 miles north of Landis, at 6.15 p.m., 4 hours and 45 minutes late, passed signal 3439, which was displaying a proceed indication, and collided with train No. 62 while traveling at a speed estimated to have been between 15 and 20 miles per hour.

Both engines were somewhat damaged but engine 4848 was able to continue its trip with train No. 62. The first two cars in train No. 55 were overturned and came to rest on the northbound main track.

Summary of evidence

Engineman Julian, of train No. 62, stated that on arrival at Landis he reduced the speed of his train as it was passing the station, which is located between the south crossover switch and signal 3451, so that the conductor could get off the caboose at that point, there was a car in the train that had a quick-acting brake, however, and as a result thereof the air braker applied in emergency, bringing the train to a sudden stop, with its center about opposite the station. The train was then moved ahead and upon receiving a stop signal was brought to a stop with the caboose north of the crossover. Engineman Julian said that it stood at this point for several minutes, probably about three and one half minutes, during which time he was looking ahead for approaching southbound trains and also to the rear for a back-up signal, on receiving the latter signal, given from the rear of the train on the fireman's side, the train was backed through the crossover at a speed of about 6 miles per hour. As his engine reached the southbound main track he saw a reflection from the headlight of engine 484, of train No. 55; he

looked out of the window, heard that engine working steam, opened the throttle wide on his own engine, and estimated the speed of his train to have been increased to about 8 miles per hour when the collision occurred. Engineman Julian further stated that Head Brakeman Cornelison, who had been riding on one of the cars near the head end of the train, came over to the engine before the back-up movement was started, secured flagging equipment, including lanterns and fusees, and got off while the train was standing at this point. Engineman Julian said everybody concerned understood what movement was going to be made, and that he did not whistle out a flag or say anything to Head Brakeman Cornelison about protecting against southbound trains, nor did he see anything of the head brakeman after the latter got off the engine, and he expected the head brakeman to afford flag protection from that immediate vicinity, the way it had always been done, saying he considered that the head brakeman was out a sufficient distance when he got off the engine and crossed over to the southbound main track, and that by flagging with a lighted fusee from that point there would have been ample distance within which to have brought any train to a stop.

Fireman Holloman, of train No. 62, stated that after his train came to a stop north of the crossover he was on his seat box looking back toward the rear of his train and that he saw Flagman Parker and Swing Brakeman Mooney each throw one of the crossover switches. While he could not say positively how long it was after the crossover switches were thrown before Swing Brakeman Mooney gave a back-up signal, he did say that it was only a few seconds afterwards, and that he told Engineman Julian that everything was all right whenever he wanted to back up but that the back-up movement was not started for about two minutes. Fireman Holloman did not see Head Brakeman Cornelison when his train first stopped and said that the train had been standing a minute or two before he did see him and that the head brakeman only stayed on the engine long enough to secure the flagging equipment and get off, and to the best of the fireman's knowledge the head brakeman got off before the back-up movement was started, at which time his red lantern was burning properly. Fireman Holloman said that before the back-up movement was started he looked toward the north to see if any train was approaching but that afterwards he continued to look back toward the rear of his train for signals and was unaware of anything wrong until Engineman Julian opened the throttle wide; he estimated the speed of his train to have been between 6 and 8 miles per hour. Fireman Holloman further stated that he took it for granted the head brakeman was going to afford protection and that there was no difference between the way the crossover

movement was being made the same and the way it was made on the last occasion.

Head Brakeman Cornelison, of train No. 62, stated that Conductor Gordon told him about protecting the train, called attention to the handling of switches, flagging when crossing over, etc., he was riding on the third car from the engine, a tank car, when the emergency application of the air brakes occurred while passing the station at Landis, bringing the train to a stop. He said that he got down and walked to the engine with his lighted white lantern, climbed aboard the engine, told Engineman Julian that he guessed he would have to flag, and secured a red lantern and two fusees, already having two torpedoes in his pocket. After his train had stood on the northbound track from two and one-half to three minutes the back-up movement was started and he then started down the steps on the fireman's side of the engine. On reaching the lower step he looked around but did not see any sign of an approaching southbound train and after riding about two car-lengths he got off and started back on the southbound main track and just as he looked up the reflection of the headlight of engine 4884 flashed in his face. On looking at his red lantern he saw that it was not burning and he thought that it probably had become extinguished when he jumped off, he maintained that he then tried two or three times to light a fusee but that it failed to ignite, that he then waved stop signals with a lighted white lantern, and that on noticing that the speed of train No. 55 was not decreasing he lighted the other fusee, without difficulty, by which time the engine was about opposite him, the collision occurring shortly afterwards. Head Brakeman Cornelison said that while he did not know positively he thought that he reached a point about opposite where his engine had stood before the back-up movement started, or about a train length north of the crossover, and that he was on the engineman's side of train No. 55 when it passed him. He did not place torpedoes on the rail. Head Brakeman Cornelison knew what moves were to be made at Landis and fully understood that it was his duty to protect against southbound trains while the crossover movement was in progress.

Conductor Gordon, of train No. 62, stated that he got off the caboose as the train passed the station, northbound, obtained the switch list, and started walking northward in order to afford protection at a grade crossing for the back-up movement. At this time the crossover switches had already been lined up to back over, with Swing Brakeman Mooney standing on the ground near the crossover and Flagman Parker on the rear end of the caboose, which stood about three or four car-lengths north of the crossover. Conductor Gordon said that the flagman sounded the air whistle signal and that he, the conductor, gave

a back-up signal, which in turn was relayed by Swing Brakeman Mooney, and that the train then started the movement. As it backed through the crossover Conductor Gordon stood at the grade crossing and saw finally that his entire train was through the crossover. At this time he also saw the reflection from the headlight of the engine of train No. 55 and a lighted fusee on the west side of the southbound main track, the collision occurring immediately afterwards. Conductor Gordon said that he had instructed Head Brakeman Cornelison to afford protection against southbound trains and that after the accident the head brakeman came to him and handed him a fusee, saying that it would not light. Conductor Gordon had no positive information as to how long the crossover switches had been open when he gave the back-up signal but said that he saw either the swing brakeman or the flagman make a motion with a lighted lantern, such as would have been made to throw a switch, as soon as his train came to a stop, and that after having seen this motion made his train stood not less than two minutes nor more than three and one-half minutes before starting the back-up movement. Conductor Gordon said that there was ample time at the disposal of Head Brakeman Cornelison to have gone northward a sufficient distance to have afforded proper protection and that he felt absolutely safe in every move his train was making.

Flagman Parker, of train No. 62, stated that he got off the caboose as it passed over the north switch of the crossover and that after receiving a back-up signal, given by Swing Brakeman Mooney, the flagman walked to the caboose and got on the rear platform. Flagman Parker said that his train stood on the northbound track about two or three minutes before starting the back-up movement.

Swing Brakeman Mooney, of train No. 62, stated that he got off the caboose as it passed by the south switch of the crossover, opened that switch before his train came to a stop just north of the crossover, and that his train stood about two and one-half to three minutes before starting to back over.

Engineman Roper, of train No. 55, stated that his train passed signal 3439 under a proceed indication and approached Landis at a speed of about 35 miles per hour. He saw the reflection from the headlight of engine 4848, of train No. 62, thought it was train No. 12, and therefore shut off steam and applied the independent engine brake, bunching the slack, having in mind that he would not run between the train and the station landing. On seeing the exhaust from the stack, however, he concluded that the train was departing and released the independent engine brake, and it then occurred to him that it was probably train No. 62 performing work at that point, as he realized

it was not quite time for train No. 12 to have reached Landis. After rounding the curve and entering upon the straight track he saw no sign of a lighted fusee or other signal calling attention to the crossover movement being made, and although the reflection of the headlight of engine 4848 materially affected his vision he did see a white lantern in the vicinity of the station. The boiler and headlight of engine 4848 then appeared directly in front of his own engine and the indication of signal 3451, located south of the station, changed from green to red, it at once occurred to him that a back-up movement was being made through the crossover and consequently he applied the air brakes in emergency, but was unable to stop. Engineman Roper said that he could not see anything on account of the reflection of the headlight of engine 4848 and thought that had he been properly flagged the accident would not have occurred. It was Engineman Roper's opinion that at the rate of speed at which his train was traveling the distance between signal 3439 and the crossover could easily be covered in two minutes.

Head Brakeman Bowen, of train No. 55, who was riding in the cupola on the back of the engine tank, said that his attention was attracted to a man on the ground on the engineman's side and that the man shouted something, what it was he did not know, and that he saw the flash of a fusee. At this time the speed of his train was about 15 miles per hour, and the collision occurred after the train had traveled an additional distance of about three or four car-lengths. Conductor Barton, who was riding on the rear platform of the caboose, estimated the speed to have been between 15 and 20 miles per hour when the collision occurred. After getting on the ground he saw a lighted fusee, and on going forward he saw Head Brakeman Cornelison standing about 15 car-lengths north of the grade crossing, holding the fusee; this grade crossing is 363 feet south of the north crossover switch.

The automatic train-control system is of the intermittent inductive auto manual type, manufactured by the General Railway Signal Company. The records disclosed that the automatic train control mechanism on both engines was in good condition, while tests made of the signals and switches subsequent to the accident disclosed them to be operating as intended.

Conclusions

This accident was caused primarily by train No. 62 making a back-up movement through a crossover without proper flag protection, for which Head Brakeman Cornelison, Engineman Julian and Conductor Gordon are responsible.

When train No. 62 had stopped clear of the crossover, Head Brakeman Cornelison provided himself with flagging equipment but according to his own statement he did not get off the engine at once but rode on the steps for a short distance after the back-up movement had started, then got off, turned around, and saw the approaching train on the southbound track. At this time he found that his red lantern had gone out and was unable to light one of the two fusees which he carried, and on account of the time consumed in these belated efforts to provide flag protection he had no time to put down torpedoes and was able only to light the second fusee at about the time the train passed him. Engineman Julian paid no attention to what the head brakeman was doing and did not know of his location or whether flag protection had been provided for his train before starting the crossover movement; he said that all concerned knew what move was to be made, and apparently he assumed that each member of the crew would perform his own particular duty without any supervision. As for Conductor Gordon, it is true that he was at the rear end of his train and that he had told the head brakeman what to do and should have been able to rely on Engineman Julian to see that the head brakeman performed his duties; on the other hand, however, Conductor Gordon personally gave the signal to back through the crossover and from his position it is believed that with a short train and straight track he should have seen that Brakeman Cornelison was not providing proper flag protection.

The estimates as to the time consumed between the stopping of train No. 62 and the starting of the back-up movement varied from two minutes to three and one-half minutes. The evidence indicates, however, that the middle brakeman and the flagman dropped off at the crossover as their caboose passed it, each of them opening one of the switches, and that a back-up signal was given and acted upon within less than two minutes after the train had been brought to a stop, but since no warning was given to the crew of train No. 55 either by flag or by the automatic signal and train control system, there is no assurance that a wait of the full two minutes required by the automatic block signal rules would have prevented an accident, although it is possible that train No. 55 might have collided with some of the cars as they were moving through the crossover instead of colliding head-on as actually was the case. In reaching this conclusion no credence is given to the statement of the engineman of train No. 55 that at the speed at which his train was traveling it could have easily covered the distance between signal 3439 and the crossover in two minutes. This distance is about 1.8 miles; to have covered it in two minutes would have required an average speed of about 54 miles per hour, and

there is no evidence to indicate that this train was or had been moving at any such rate of speed.

As was the case with the collision which occurred on this railway at Danville, Ky., on April 10, 1928, due to an open switch, the accident here under investigation occurred on a line protected by automatic block signals and an automatic train control device of the intermittent inductive type, known as the auto-manual automatic stop, manufactured by the General Railway Signal Company. Subsequent examination and test showed the signal system to be well maintained and operating properly, and the records showed that the locomotive equipment of the train control device was in good condition. The accident itself is of a type which an automatic train control device is intended to prevent, but under the circumstances there was no opportunity for the device to perform its intended function since it appears that train No. 55 had passed the track inductor located about 70 feet in the rear of signal 3439 before the track circuit was broken by the opening of the crossover switches. The facts here pointed out, therefore, can lead only to the conclusion that the present rule requiring a train to wait two minutes after a main line switch has been opened, even if strictly observed, does not afford protection at this particular point if a south-bound train is just passing signal 3439, unless the approaching train is moving at a speed of at least 54 miles per hour; in the latter event it would reach the crossover location by the time the back-up movement was due to start. In the case of a train moving at a lower rate of speed, as was the case with train No. 55, it could pass signal 3439 immediately prior to the opening of the switches, thus receiving a clear signal indication, and still be nearly 1 mile distant when a back-up movement through the crossover could properly be started under the two-minute requirement of the rule.

All the employees involved were men of long experience, 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.