In re investigation of accident which occurred on the Southern Railway at Crosswell, S. C., on August 9, 1916.

On August 9, 1916, there was a head-end collision between a passenger train and a freight train on the Southern Railway at Crosswell, S. C., which resulted in the death of the engineman of the passenger train and the injury of two employees and three passengers. After investigation of this accident the Chief of the Division of Safety submits the following report:

This part of the Southern Railway is a single track line. Train movements are handled by time-table and train orders, supplemented by a manual block signal system. The accident occurred at a point ab ut 230 feet south of the station. The passenger train was standing at the time it was struck by the freight train. Approaching the point of collision from the south there is a four degree curve to the left, about 1,100 feet in length, the last part of this curve passing through a dirt cut varying from 15 to 20 feet in height. The track is then tangent for about 750 feet to the south passing track switch. Beyond this switch the straight track continues for an additional distance of 360 feet, at which point is the beginning of a 2 degree curve to the left, the accident occurring on this curve, at a point about 390 feet north of its southern end. Approaching Crosswell, the grade is descending for about two miles, the average being about one per cent.

Southbound passenger train No. 11 consisted of 2 baggage and express cars, 1 mail car, 3 coaches and a business car, hauled by locomotive 1226, and was in charge of Conductor Roseborough and Engineman Harris. It left Greenville at 4.20 p. m., 1 hour and 15 minutes late, having among others an order to meet train second No. 76 at Crosswell. Train No. 11 arrived at Crosswell at 4.41 p. m., and had been at the station about one minute when it was struck by train second No. 76.

Northbound freight train second No. 76 consisted of 29 cars and a caboose, hauled by locomotives 856 and 636. At Toccoa, Ga., 67 miles south of Greenville, the dispatcher saw that the crew would not reach Greenville without being on duty more than 16 hours. For the purpose of relieving the crews in charge of train second No. 76, when the sixteen-hour period expired, a train crew and one engine crew was sent from Greenville, and Trainmaster Keever who was then at Toccoa, was notified to arrange for an additional engine crew from that point, as no more crews were available at Greenville. Trainmaster Keever secured Fireman Woodall and these two men rode on train second No. 76 from Toccoa to Central, a distance of 41 miles. The trainmaster then notified the entire crew that they were relieved from duty and ordered them to deadhead to Greenville. Trainmaster Keever and Fireman Woodall remained at Central, a period of two and one-half hours, waiting for the relief crew which was being forwarded from Greenville. On their arrival, train second No. 76 departed from Central

at 3.46 p. m., with Trainmaster Keever acting as engineman and in charge of the leading locomotive and Engineman Sisk in charge of the second locomotive, Conductor Deaton being in charge of the train. A stop was made at Liberty, S. C., 7.7 miles from Central, for orders. The train left Liberty at 4.12 p. m., passed Easley, S. C., 14.2 miles from Central, at 4.28 p. m., and collided with train No. 11 at Crosswell at about 4.42 p. m.

The passenger locomotive was quite badly damaged, while the first baggage car mounted the tender frame and forced the cistern forward against the engine cab. At this time Engineman Harris was in the gangway on the left side, about to jump, and he was caught by the cistern and instantly killed. The leading locomotive of the freight train was also quite badly damaged, while only slight damage was sustained by the second locomotive. The first car in the freight train was a steel gondola and it was not derailed, or damaged to any extent, but the next ten cars piled up and were practically destroyed.

Conductor Deaton of train second No. 76, stated that after leaving Easley his train maintained a speed of 20 miles an hour. He stated that he was riding on the leading locomotive and just as the top of the hill was passed, between Latham and Crosswell, Trainmaster Keever made an application of the air brakes, at which time eleven retainers were turned up on the head end of the train. This application reduced the speed from 20 miles an hour to about 15 miles an hour.

About one mile beyond this point another application of the air brakes was made, the brakes not being released between the applications. When about one quarter of a mile from the switch, Trainmaster Keever sounded a back-up signal as a warning to train No. 11. The trainmaster then asked him to help reverse the locomotive and he did so, after which he gave a back-up signal with his hand to the engineman of the second locomotive. Conductor Deaton said that after reversing the locomotive the trainmaster opened the sanders and applied the emergency air brakes. The trainmaster also sounded the back-up signal two additional times, the last being just before reaching the switch. Conductor Deaton jumped from the locomotive as it passed the south passing track switch, and he thought the speed at that time was not more than 10 miles an hour, as he did not fall when getting off. He also said that no test of the air brakes was made by him after taking charge of the train at Central; the only thing that was done was to see that there was air throughout the train, and he did not know what percentage of air was working when the train left Central. He said it was not customary to depart under such circumstances, without ascertaining the percentage of air brakes, or testing the air, but in this case the train was a through train and the trainmaster had been traveling with it, and it was supposed to have the proper percentage of air. He said he was supposed to go back over the train and ascertain the condition of the brakes but he did not do so and was not asked about their condition by the men in

charge of the locomotives.

Brakeman Thomas stated that just before the head end of the train started over the hill, approaching Crosswell, he turned up the retainers on the first 11 cars in the train, all of these retainers being turned up before the brakes were applied. He stated that the first application of the brakes, which was made just after the train started over the hill, reduced the speed from 20 miles an hour to about 8 miles an hour in a distance of one and one-half miles. In all, three applications were made, the brakes not being released between any of the applications. He also said that he heard the air in the retainers on three occasions, each about one and one-half minutes apart. When the train was 600 or 700 yards from the switch, he heard three blasts on the whistle and the signal for brakes, these signals being repeated, and he said that he had applied two hand brakes before the collision occurred. He thought the speed was about 10 miles an hour when the trainmaster called for brakes, and six miles an hour when the switch was passed. He also said that at Central he saw that the air was coupled up on 17 cars, and also tested the air on the seventeenth car. When the train left Central no test of the air brakes was made. In his three months experience as a trainman he had received special instruction from the conductor, but had never been instructed regarding the use of air brakes, except to see that they always had air.

Flagman Sitton stated that after the train was coupled up at Central a stop was made on the main line for

the purpose of taking water. This was on a descending grade, and the stop was made with the air brakes. He was on the caboose and knew that the air was working through the entire length of the train. When the train started over the top of the hill, coming into Crosswell, he was riding on top of the caboose, and saw the head brakeman turning up retainers. He heard a signal for brakes and applied the hand brakes on the caboose and on the rear car; the brake on the next to the rear car was not in order and he then applied the hand brakes on the car immediately ahead of it, the collision occurring while he was applying this brake. He said that he thought the speed, starting down the hill, was about 20 miles an hour and that the train had not proceeded far when an application of the brakes was made, and he could feel the speed of the train being reduced. He also said that he could hear air escaping from the retainers, just after the head end of the train had passed over the top of the hill and before the rear end of the train reached the top of the hill. He did not know how many applications of the air brakes were made and did not notice air escaping from the retainers at any other time. He thought the speed was about 8 or 10 miles an hour when the locomotive approached the switch at Crosswell and it was reduced to some extent between there and the point of collision. He was unable to state whether or not the air was applied on the cars at the time of the collision. Flagman Sitton further stated that on leaving

Central he looked at the air gauge in the caboose and it showed a pressure of 70 pounds. After taking charge of the train at Central no terminal test of the air brakes was made. He said that it was always his practice, however, when relieving another crew in this manner, to see that the air was working through to the rear of the train and he was told by the conductor to attend to this. He did not report the condition of the brakes either to the conductor or to the engineman, neither did he know whether or not any cars were cut out, or whether the required percentage of air brakes were in working order leaving Central.

Engineman Sisk stated that when he reached Central he asked Trainmaster Keever about locomotive 856, the leading locomotive, and the trainmaster said that he had been running it. Engineman Sisk then said to go ahead, and boarded the second locomotive. He found the engineer's air brake valve cut out, and stated that he did not at any time cut it in. The speed of the train was about 20 miles an hour when it started over the hill approaching Crosswell. He shut off steam before starting down the hill. Shortly afterwards Trainmaster Keever shut off steam and Engineman Sisk stated that the trainmaster applied the brakes about half a mile beyond where he shut off steam, the speed at the time being about 18 or 20 miles an hour. Three or four applications of the air brakes were made, the first being the heaviest. The forward part of the train seemed to be checked, but he could feel the rear of the train pushing the locomotives

ahead. He did not think the brakes were releas d and said that the speed was about eight miles an hour when the switch was passed. When about 200 yards south of the switch he reversed his locomotive, and at this time he thought the train would stop in safety. Engineman Sisk stated further that when he boarded the locomotive at Central he noticed that the air pressure was 90 pounds main reservoir and 70 pounds train line, but between Central and the point of accident he did not pay particular attention to the pressure and did not know that Trainmaster Keever had lost control of the train until the conductor signaled to him to reverse his locomotive. He stated that he did not apply the straight air brakes at any time. He also said that he had run trains down this hill and had taken the siding at Crosswell, and that while it was not difficult to handle a train down the grade, there had been occasions when he had run past the switch. He considered it a hard place to stop with a heavy train and said that, knowing it was a hard place to stop, it would have been proper to have ascertained the condition of the air brakes before leaving Central, butnothing was said to him about the brakes and he thought it should have been attended to by the man in charge of the leading locomotive.

Fireman Woodall stated that the brakes worked satisfactorily when making the stop at Liberty. The speed of the train was about 15 miles an hour passing the top of the hill, and the first application of the brakes was made about one-half mile beyond. He thought there were three 10-pound applications made, but did not know whether or not the brakes were released

between the applications. At no time did the trainmaster say anything to him about the movement of the train or not being able to control it. The train was about at the station board south of Crosswell when it first became apparent to him that the train was beyond control. At this time the trainmaster had the air brakes applied in emergency and just after passing the station board, the trainmaster and the conductor reversed the locomotive.

Trainmaster Keever stated that when train second No. 76 reached Central they had to wait for the relief crew. When it arrived he told them they would find the train on the passing track and Engineman Sisk asked him which locomotive he was to handle. Trainmaster Keever told him to take either one he wanted and as they walked toward the locomotives, Engineman Sisk asked how locomotive 856 was working, and when he said that that locomotive was in good order the engineman told him to take it and that he would take locomotive 636, which was the second locomotive. In making various movements at Central the air brakes were used and no difficulty experienced. Leaving Central the air pressure was up to the maximum. Approaching Liberty the speed was 12 or 15 miles an hour and he worked steam on the ascending grade until within 100 yards of the semaphore signal. He then shut off steam, made a 12 or 15-pound reduction and stopped with the locomotives opposite the signal. No stop was made after leaving Liberty and the train passed the top

of the hill approaching Crosswell at a speed of 12 or 15 miles an hour, and this was soon increased to about 18 miles an hour. When about 25 car lengths from the top of the hill he made about an 8-pound reduction, the brakes apparently applying in the proper manner, and after traveling about 300 yards he placed the brake valve handle in the holding position, where it was left until the train was a mile or a mile and a half beyond Latham. The speed of the train seemed to remain at about 18 miles an hour and the air pressure was pumped up to 70 pounds. After passing Crosswell station board, preparatory to making a stop for the purpose of heading in on the passing track he made a second application of the air brakes, this being about 10 or 12 pounds, and after running a distance of 10 or 12 car lengths he felt only a very slight checking of the speed and made another reduction of 12 or 15 pounds. At this time the train was rounding the curve about half way between the station board and the south switch. He did not feel any response from these air applications and called to the conductor that he did not think he would be able to stop clear of the switch. He then noticed that the air gauge showed 40 pounds pressure and placed the brake valve in the emergency position and opened the sanders. He felt the speed of the train lessen and it was reduced to about 10 miles an hour. He knew that train No. 11 was standing on the main line and in order to make sure that he would stop, he asked the conductor to help him in reversing the locomotive. He then felt that all he could do was to call the attention of the crew of

train No. 11 to the fact that his train was going to run by the switch and he sounded a back-up signal. He did not remember the number of times he sounded this signal, but thought he sounded it four or five ti es. He then thought it was time to get off. He stated further that the brakes were in good order at Central and that after stopping at Liberty he could hear the air pumps working satisfactorily, and the air pressure was 70 and 90 pounds. After making the first application of the air brakes, descending the hill, he felt a lessening in the speed of the train and said that the brakes seemed to be working well. He did not release the driving wheel brakes, saying that he did not think it would have been safe to do so, but he did think it safe to release the train brake. At no ti e, after starting down the hill did he place the brake valve in the full release position. Trainmaster Keever also stated that he had never handled a double-header down this hill, but that on July 10th he handled a train down this hill without an enginemen in the cab with him. In his opinion his failure to stop at the switch on this occasion was due to the air not working throughout the entire train, an angle cock evidently having been turned while standing at Liberty. He stated that after the accident he made no examination to see if any angle cocks were turned, on account of not having time to do so. He also said that during the past 10 years he had had considerable experience in handling locomotives at different times and under various conditions, and that he was thoroughly familiar with this portion of the road. He also said that he

had been examined on air brakes and he thought that his experience qualified him to handle a locomotive under the rules of the Southern Railway.

Superintendent Hungerford stated that the distribution of the men on train second No. 76 was without his approval or knowledge, and that he would not have approved of the movement in question had he known of it.

A test made of the 18 cars and a caboose constituting the unwrecked portion of the equipment of train second No. 76, showed that the air brakes did not apply on 2 cars and the caboose, while on the other 16 cars the air brakes were in good working condition.

The direct cause of this accident was the failure of Trainmaster Keever properly to control the speed of his train approaching Crosswell.

Trainmaster Keever was employed as machinist apprentice in 1904; was promoted to machinist in 1908; appointed foreman of the Greenville roundhouse in 1913; and promoted to trainmaster on January 1, 1916. This investigation disclosed the fact that in his effort to expedite the movement of train second No. 76, which was necessarily tied up at Central to prevent the violation of the Hours of Service Law, he assumed the responsible position of engineman of the leading locomotive and attempted to handle this train down the heavy grade, and it is believed that owing to his inexperience as an engineman, and his failure to realize his responsibility in the position he had assumed, he wasted the air and permitted the train to

get beyond control. The evidence discloses that the air brakes on this train were working properly before it arrived at Central; that while arranging the train at this point the air brakes worked properly; while making a stop to get orders at Liberty they worked properly and from the statement of the employees on this train there is good reason to believe that the air brakes were in proper working condition approaching this meeting point.

As a preventive of accidents of this character, officials in charge of this railroad should see that before men are placed in charge of locomotives under conditions requiring them to handle trains on heavy grades, they shall have passed a satisfactory examination and be competent to perform their duties.