

In re Investigation of an accident which
occurred on the Norfolk & Western
Railway at Belspring, Va.,
July 21, 1916.

On July 21st, 1916, there was a rear-end collision between two freight trains on the Norfolk and Western Railway at Belspring, Va., which resulted in the death of two employees and injury to six employees.

The Radford Division of the Norfolk and Western Railway on which this accident occurred extends from Roanoke, Va., to Bluefield, W. Va., a distance of about 100 miles, and is double tracked with the exception of three short sections of single track, aggregating 13 miles.

On this division the movement of trains is controlled by time-table, train orders and an automatic block signal system, except on two of the single-track sections, aggregating 11 miles in length. The accident occurred on one of these single track sections extending from Pepper to Belspring, a distance of 3.8 miles. Between these two points the movement of trains is controlled by a manual block system, being an absolute block for passenger trains and a permissive block for freight trains. Train orders and block information are transmitted by telephone. Approaching Pepper from the east the line is double track, converging into single track at Pepper station. From Pepper westward, the line consists of a series of curves for about 1.4 miles to Low Grade Tunnel, which is 3,300 feet in length. Emerging from the west end of the tunnel

there is a curve to the left about 1600 feet in length; this is followed by a curve to the right 3,300 feet in length and having a maximum curvature of 5 degrees. Following is a 45-minute curve to the left 1,000 feet in length around a bluff on the south side of the track; the line is then tangent a distance of 3,000 feet, practically to the beginning of double track at Belspring station. Beginning at the east end of the second curve mentioned, the roadbed follows the south bank of the New River westward to the east end of the tangent. At a point about 500 feet west of the east end of the tangent, is located the east switch of Belspring passing siding. This siding is about 2,600 feet long and parallels the main track on the south extending into the eastbound track at the beginning of double track at Belspring station. In this territory there is a grade of 21 feet to the mile descending westward, and at the point of accident the track is on a fill about 15 feet in height.

Extra 1423 consisting of a locomotive, 27 loaded, 2 empty cars, and a caboose, in charge of Enginemen Fowler and Conductor Gardner, left Roanoke, Va. at 10.00 p. m., en route Bluefield, W. Va. At Salem, about 6 miles west of Roanoke, the train picked up a camp outfit, consisting of seven living, tool, and supply cars, used by a fence construction gang. Accompanying the outfit in the living and sleeping cars, were 29 men. The train left Pepper 37 miles west of Salem at 2.08 A. M., and arrived at Belspring

at 2.26 A. M., where it was stopped by the automatic signal at the beginning of the double track, due to several trains ahead which were held on account of a derailment at Berton, a station several miles west. When Extra 1423 came to a stop the train stood on the single track main line, between the switches of the passing siding with the engine opposite the station near the beginning of the double track and the caboose stood at a point 1,023 feet west of the east switch of the siding. At 2.35 a. m., eastbound passenger train No. 16 left Dry Branch, 2.9 miles west of Belspring. As Extra 1423 was occupying the main track at Belspring, the train dispatcher instructed that No. 16 be run through the passing siding, around Extra 1423. Arrangements were made accordingly and No. 16 passed Belspring at 2.45 a. m., having received a clearance card reading, "Block clear."

Extra 1425 consisting of a locomotive, 83 empty cars and caboose, in charge of Engineman Mayo and Conductor German, left Roanoke at 10.15 P. M., en route Bluefield and arrived at Pepper at 2.30 a. m., where it stopped clear of the single track to await the arrival of train No. 16, which passed at 2.55 A. M. At 3.09 A. M., Operator Davis at Pepper issued a clearance card to Extra 1425, reading "Block clear," and the train departed at 3.15 A. M. Approaching Belspring the train was running at a speed of 10 or 12 miles per hour when it collided at about 3.30 A. M. with the rear of Extra 1423, standing on the main

track east of Belspring station.

The caboose car of Extra 1423 and the next car ahead, which was a car loaded with fence posts, were thrown down the embankment on the right side of the track and were destroyed. The third car from the rear was broken in two and the east end thrown to the left across the passing siding. This car was used as a sleeping car and was occupied by 18 laborers, 2 of whom were killed. The next car ahead, a tool car, was derailed and its east end forced upward from its trucks. The headlight and pilot of engine 1425 were damaged and the pony truck was forced backward under the engine. One steel hopper car near the middle of Extra 1425 buckled and five other hopper cars were damaged.

The operation of the telegraph block system between Pepper and Belspring is governed by the general rules for the operation of telegraph blocks supplemented by time-table rule No. 114, which is in part as follows:

114. Trains will be operated between Pepper and Belspring as follows:

All eastbound trains will proceed from Belspring when block signal indicates "clear." All westbound trains will proceed from Pepper when block signals indicate "clear."

Westbound trains will be advanced by orders (form 31 exclusively) issued to operators instead of conductor and engineer. Orders will not be delivered to trains involved except operators at Belspring will deliver to first eastbound train arriving before westbound train given right thereto has cleared and operator at Pepper will deliver order only to conductor of last train when order includes more than one train.

Conductor of westbound train receiving copy of such order will deliver, without stopping train, from rear car to operator at Bel-spring and the operator at this point will not display a clear signal for eastbound trains until order has been received and compared with orders held by him to hold eastbound trains and in addition personally observe that all trains mentioned have cleared. For example:

"To operators at Belspring and Pepper."
Clear No. 1 engine 568 to Belspring"

Note-Under above order-Before eastbound trains proceed from Belspring and before westbound trains proceed from Pepper the operators at these points will deliver to the conductor and engineer, a clearance card indicating position of the block.

In addition to the manual block system the movement of trains through Low Grade Tunnel is protected by absolute automatic block signals located about one-half mile on each side of the tunnel. These signals are operated entirely independently of the manual block system.

It is the practice on this division to permit a train to occupy the main track, between and clear of the switches of a passing siding, without flag protection, except in foggy weather. This practice is authorized by special time-table rule No. 14 and rule 99b, which are quoted below.

Time-table rule No. 14:

Rule No. 86, Book of Rules, is modified to the extent that extra trains will have the right to stand within station limits, yard limits, coaling and water stations, without protecting against third and fourth-class trains, and fourth-class trains will have the right to stand at such named points without protecting against third-class trains.

As an additional safeguard during foggy weather, at all points between station limits, coaling stations, and water tank limits, wherein the rear of a train cannot be plainly seen, flagging will be necessary.

These instructions in no way relieve trainmen and engineers from observing all rules in connection with approaching and running through stations, water tank and coaling station limits under full control.

Rule 86:

An inferior train must keep out of the way of a superior train.

Rule 99:

When a train stops or is delayed under circumstances in which it may be overtaken by another train, the flagman must go back immediately with stop signals a sufficient distance to insure full protection. When recalled he may return to his train, first placing two torpedoes on the rail, when the conditions require it. The front of the train must be protected in the same way, when necessary, by the front brakeman or in his absence by the fireman.

Rule 99b:

All trains, except first-class and those running on train order schedule, must approach all stations, water tanks and coaling stations between stations, under control and so proceed until the track is plainly seen to be clear. The responsibility for a collision at a station, coaling station or water tank between stations, will rest with the following or incoming trains. This will not relieve trainmen and engineers from the responsibility of protecting their trains at stations, as provided in Rules 86 and 99.

Operator Stafford at Belspring stated that shortly after extra 1423 arrived at his station, one of the brakemen came to the telegraph office and reported that the rear of the train was clear of the east switch of the passing siding. As soon as train No. 16 was reported as leaving Dry Branch, he told the dispatcher of the position of extra 1423. The dispatcher then sent a message to Conductor Gardner to arrange to run No. 16 through the passing siding. Operator

Stafford said that he then called Operator Davis at Pepper and told him that extra 1423 arrived at 2.26 a. m. and was standing on the main line east of the station and that No. 16 would be run through the siding. When No. 16 cleared at Pepper and the dispatcher had issued the block order for extra 1425, Operator Davis called him and asked him for the block for extra 1425; he then told Davis again that extra 1423 was standing on the main track east of the station, whereupon Davis replied that he would give extra 1425 a "green block." Operator Stafford stated further that about 2.30 or 2.35 A. M. he looked from his office window and could see the rear lights of extra 1377, standing about 1400 feet west. He did not, however, note the condition of the weather at the time of the accident.

Operator Davis at Pepper stated that sometime after extra 1423 left his station, Operator Stafford called him and said that extra 1423 arrived at 2.26 a. m. and was standing east of the station; also that No. 16 was to be run through the passing siding. After No. 16 cleared at Pepper the dispatcher issued permit orders for three west-bound extras, 1425, 1371, and 104. He stated that he then called Belspring and asked for the block for extra 1425. He did not recall whether anything was said at that time about the position of extra 1423, although he understood that it was standing on the main track east of Belspring station. It was his intention to give extra 1425 a clearance card reading, "Block green," and he had so marked his train

sheet. A clearance card was issued to extra 1425 and it departed at 3.08 A. M. At that time the weather was very foggy. It was not until after the accident had been reported that he discovered from his carbon copy that the clearance card which he had given to extra 1425 read, "Block clear." Mr. Davis was unable to account for this error.

Engineman Fowler of extra 1423 stated that between Pepper and Belspring, he encountered some streaks of fog, but not enough to obstruct his view of signals. As he approached Belspring, he could see the lights on the signals at the station, some 60 or 70 car lengths distant. He stated that at the time the accident occurred he was on his engine and the force of the collision drove it forward about two feet. After the accident he went to the rear of his train, reaching it about 15 minutes later, and at that time there was considerable fog.

Conductor Gardner stated that when Rear Brakeman Langhorne returned to the caboose after throwing the switch for train No. 16, to pull out of the siding, they had some conversation about the fog. Sometime after No. 16 had passed, thinking he heard a train approaching, he climbed up into the cupola of the caboose, thrust his head and shoulders out of the window and looked backward; he saw nothing however, but the switch light at the east end of the passing siding. He continued to hear the sound and as it appeared to be moving very slowly, he concluded that it was an eastbound train approaching the station so he turned and looked in that direction. He saw the lights in the telegraph office and the

signal lights at the station, but no train. He was in this position looking toward the station when the accident occurred.

Conductor Gardner stated that he knew that if the dispatcher permitted another westbound train to follow from Pepper and stand behind extra 1423 at Belspring, it would block the east switch of the passing siding and prevent eastbound trains from pulling through the siding. He was satisfied that the dispatcher would continue to run eastbound trains through the siding and therefore he was not watching very closely for the westbound movement. Conductor Gardner stated further that he is familiar with the rule that requires flag protection when standing between switches of a passing siding in foggy weather, but did not consider that the weather was sufficiently foggy at that time to require the flagman to go back.

Rear Brakeman Langhorne of extra 1423 stated that he was in the caboose when he heard a train approaching and thought it was coming from the west. Later he looked back and saw extra 1423 about an engine length distant. It was then running so slowly that he expected it to stop before colliding. He stated that it was slightly foggy at the time, but he did not consider it dense enough to require him to go back to protect the rear of his train.

Brakeman Pyrtle of extra 1423 stated that he did not notice any fog at the time his train arrived at Belspring. At the time the accident occurred he was at the station, but

went immediately to the rear of his train arriving there about 10 minutes later. At that time the fog was so dense that he could not see plainly for a distance of more than 4 or 5 car lengths.

Engineman Mayo of extra 1425 stated that a few minutes after train No. 16 passed Pepper, he received a clearance card reading, "Block clear." After leaving Pepper there seemed to be considerable fog in streaks, becoming more dense as the train proceeded westward. Approaching Belspring he was looking out of the cab window and as the train came onto the straight track east of Belspring, he saw the light of the east passing siding switch and a watchman standing beside it. He continued looking ahead and shortly afterwards saw a red light; an instant later a second red light appeared and at that time he thought that they were the lights on the train order and automatic signals at Belspring station. He was about to call "Red board" to his fireman when he saw a caboose just at the front of his engine. He immediately made an emergency application of the brakes and jumped. Engineman Mayo stated that approaching the point of accident his train was running about 12 miles per hour. The fog was so dense that while lights could be seen a short distance, an object could not be distinguished beyond the pilot of his engine. He stated further that if the flagman had been back 8 or 10 car lengths or had had torpedoes placed on the rail, the accident would not have occurred. Engineman Mayo stated further that when he received clearance card

at Pepper reading, "Block clear," he expected to find the block clear to the telegraph office at Belspring, but understood from other rules that he must have his train under control when approaching the outer switches of passing sidings. He further stated that he understood that the purpose of the second paragraph of time-table rule 14, was merely to furnish an additional safeguard during foggy weather and did not in any way relieve the engineman of an approaching train of responsibility.

Fireman Austin of extra 1435, stated that approaching Belspring he was sitting on his seat in the cab; at that time the weather was very foggy. After entering the straight track, he saw two red lights about 5 or 6 car lengths distant. The engineman saw the red lights almost simultaneously and applied the brakes. The collision occurred about ten seconds later.

Flagman Childress of extra 1425 stated that at the time of the accident he was riding in the caboose; as soon as he could pick up and relight his lanterns he started back to flag. At that time the fog was so dense that he could see but four or five car lengths.

Conductor German of extra 1425 stated that approaching Belspring he was riding in the cupola of the caboose. The first intimation he had of the accident was when the shock occurred; at that time the fog was so thick that he could see but three or four car lengths. He stated that he did

not know until after the accident that there was a rule which limits the block to the first switch of the passing siding at the next block station in advance, but notwithstanding this he knew that under rule 99b and time-table rule 14, trains were required to approach all stations under control, expecting to find a train standing between the switches of the passing siding regardless of whether or not a clear block had been given.

Watchman Cressel who was in charge of some construction engines just east of Belspring, stated at the time the accident occurred he was standing about 15 or 16 car lengths from the rear of extra 1423, but on account of the fog he could not see the caboose. He stated that after train No. 16 passed, the fog increased in density and at the time of the accident he could see but four or five car lengths.

Telegraph Block Rules Nos. 708 and 709, read as follows:

708. When a block signal is changed from "Stop" to "Proceed" when a train approaches, it will indicate that the block is clear to the first switch at the next block station ahead.

709. When a block signal is at "Stop" position and the operator issues a clearance card that he has no orders, or no further orders for the train addressed, and that the block is "clear" or "permissive" the train may proceed as if the signal was at "proceed" or "permissive" position.

Trainmaster Goody (Koontz) stated that in conducting examinations, employees are instructed that when receiving a clear block they must consider the block clear only as far as the first switch of the passing siding of the block station

in advance, in accordance with rule 708. He also stated that it is understood by the employees and by the management that rule 99b and time-table rule 14, modify rule 99 to the extent that a train standing clear between the switches of a passing siding, or at a coaling or watering station, is not required to protect against a train of the same or inferior class in accordance with time-table rule 14.

Signal Supervisor Harris stated that in September, 1915, the automatic block signal system was placed in service between Pepper and Belspring, but it was found that the traffic could not be successfully handled on account of work trains doing construction work preparatory to double tracking, and on account of a work car engaged in concrete work in the tunnel; after about a week it was abandoned and the manual block system was restored. It is expected that the double tracking on each side of Low Grade Tunnel will be completed and an automatic block signal system placed in service between Pepper and Belspring by January 1st, 1917.

This accident was caused by the failure of Engineman Mayo of extra 1425 to have his train under control approaching the passing siding at Belspring as required by rule 99b. This rule required him to approach this point expecting to find a train occupying the main track without protection, and he should have had his train under such control that it could have been brought to a stop in time to avoid collision, should such a condition be found. The fog that prevailed at the time of the accident should have prompted him to use

more than ordinary care in approaching this point. Notwithstanding the fact that Engineman Mayo received at Pepper a clearance card reading "Block clear," under Telegraph Block Rules 708 and 709, he had no authority to assume that the track would be unoccupied as far as the telegraph office at Belzring.

Contributing to the cause of this accident was the failure of Conductor Gardner and Flagman Langhorne to protect the rear of their train during a fog as required by second paragraph of time-table rule 14. While the fog may not have been dense at the time their train stopped, the fact of their conversation after the passage of train No. 16, more than half an hour before the accident occurred, shows conclusively that there was a question in their minds as to the necessity of flag protection. These employees being familiar with the conditions at this point and knowing that in such close proximity to the river the fog was likely to arise quickly as well as to lie in banks, they should have taken every precaution to secure the safety of their train.

Also contributing to the cause of this accident was the error on the part of Operator Davis at Pepper, in delivering to extra 1425 a clearance card reading, "Block clear," when as a matter of fact the block had not been cleared.

Engineman Mayo entered the service as engineman August 15, 1905, and at the time of the accident had been on duty 6 hours and 15 minutes.

Conductor Gardner entered the service as brakeman in April, 1891, and was promoted to conductor in December 1892. Rear Brakeman Langhorne entered the service as brakeman in May, 1905. At the time of the accident Conductor Gardner and Brakeman Langhorne had been on duty 6 hours and 45 minutes.

Operator Davis entered the service as operator in March, 1907, and at the time of the accident had been on duty 3 hours and 30 minutes.