

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE DENVER
& RIO GRANDE RAILROAD NEAR MIDVALE, UTAH, JANUARY 23, 1920.

April 3, 1920.

On January 23, 1920, there was a rear-end collision between two freight trains on the Denver & Rio Grande Railroad near Midvale, Utah, which resulted in the death of 3 employees and injuries to 3 employees and 1 other person. The investigation of this accident was conducted jointly with the Public Utilities Commission of Utah, testimony being taken at a hearing conducted at Salt Lake City, Utah, on February 6, 1920. As a result of this investigation, the Chief of the Bureau of Safety submits the following report.

This accident occurred on a single-track portion of the main line of the Salt Lake Division, extending between Provo, Utan, and Midvale, Utah, a distance of 33.3 miles. Trains are operated by time-table and train orders transmitted by telephone, no block signal system is in use. The accident occurred 2,318 feet east of the yard limit board at Midvale. Approaching this point from the east there is a tangent about 4,200 feet long, followed by a one-degree curve to the left about 1,450 feet in length. The collision occurred on the curve, approximately 225 feet from its western end. The grade is slightly descending for about four miles, followed by about 2,000 feet of level track extending to the point of collision. At the time of the accident there was a dense fog.

Westbound freight train extra 582 consisted of 24 empty ledgerwood cars, 2 outfit cars, 1 flat car loaded with a ditcher, and a caboose, hauled by engine 582, and was in charge of Conductor Kirkman and Engineman Barr. This train had been engaged in loading sand at Nash gravel pit, located 11.7 miles east of Midvale, and the crew had instructions, when through work, to take 25 empty cars to Midvale and tie up for the night. Accordingly, upon completion of the work, Conductor Kirkman called the dispatcher at Salt Lake City from the telephone booth at Nash siding, informed him he was ready to go, and was given train order No. 57, reading as follows

"Eng. 582 run extra Nash to Midvale, regular
trains due Nash before Six forty five 6:45
p.m. have passed."

This order was made complete at 6.47 p.m. and according to the train sheet record the train left Nash siding at 6.55 p.m. While approaching Midvale at an estimated speed of 8 or 10 miles an hour the rear of the train was struck by extra 1186, the accident occurring at about 7:46 p.m.

Westbound freight train extra 1186 consisted of 34 loaded freight cars and a caboose, hauled by engine 1186, and was in charge of Conductor Lester and Engineman Johnson. It left Provo, Utan, at 4.55 p.m., and passed Lehi, a station 5.8 miles east of Nash, at 6.55 p.m. No record was made of the time the

train passed Nash. It passed Riverton, 5.9 miles east of Midvale at 7.26 p.m., and collided with extra 582 while traveling at an estimated speed of from 15 to 18 miles an hour.

The caboose of extra 582, the flat car carrying the ditcher, and 1 empty ledgerwood car were thrown to the left side of the track, while the 2 outfit cars were thrown to the opposite side of the track. All of these cars were destroyed by fire which broke out immediately afterwards. Engine 1186 came to rest on its left side, to the left of and clear of the track, while the tender was torn from its trucks and came to rest in a reversed position between the engine and track. The first car of extra 1186, a box car, was thrown from its trucks to the right of the track and was also destroyed by fire. The second and third cars were standing crosswise of the track east of the engine, the four following cars were derailed, but remained upright and were not materially damaged. The employees killed were the engineman and head brakeman of extra 1186 and the flagman of extra 582.

Engineman Barr, of extra 582, stated that upon finishing the reading of train order No. 57, handed to him at Nash by Conductor Kirkman, the latter had added. "and nothing close." As the train started to head out upon the main line he looked back and saw the reflection of a red light, apparently a fusee. He did not notice what time it was, but thought it was between 7.05 and 7.10 p.m. A heavy fog was encountered about one-quarter of a mile west of Riverton, which is 5.9 miles from Midvale, but he said that while passing through the station limits there he could see the rear end of his train. He had shut off steam approaching the mile board east of Midvale, and had been drifting at a speed of 8 or 10 miles an hour for about three-quarters of a mile when he felt the jar of the collision. The speed of his train at no time exceeded 15 or 18 miles an hour. He estimated that the view at the time of the collision was limited by the fog to about 4 or 5 car lengths. He stated that he received no proceed signals from the rear end of the train either at Olivers or Riverton, in accordance with rule 167, but said that he knew they had ample time to make Midvale and clear any opposing or following trains, he also said that the rule was sometimes disregarded because at some stations the curves prevented an engineman from seeing a signal from the rear of his train. Engineman Barr further stated that the accident would not have been prevented even if the provisions of rule 99 had been literally observed, this rule requires flagging only in case a train comes to a stop. Engineman Barr thought that if a red fusee had been thrown off west of Riverton it would have prevented the accident, but he said that there was no rule, either operating or special, which requires a flagman to throw off a fusee in foggy weather.

Fireman Kroescher, of extra 582, stated that after the train had pulled out upon the main track at Nash, the switch closed and the proceed signal received, he looked at his watch

and it was then 7.10 p.m. As the train left he looked back and saw the reflection of a burning fusee at the rear end. He stated that he could see the rear end of the train at both Olivers and Riverton, but no signals were passed, nor did he see any signs of a following train. The speed of the train was maintained at 15 or 18 miles an hour until Engineman Barr shut off at the first curve east of Midvale; at the time of collision his train was moving at a speed of 8 or 10 miles an hour, and they were on the lookout for the yard limit board. The fog was then so dense that he could not see more than 2 or 3 car lengths.

Head Brakeman Black, of extra 582, stated that as the train was pulling out of the switch at Nash he saw the reflection of a red fusee at the rear of the train. He thought it was about 7.10 p.m. after the switch had been closed and the proceed signal received from the rear end. He said he was looking for signals from the rear end when passing the various stations en route to Midvale, but none was given. Fog was first encountered just beyond the station at Riverton, but the speed was not reduced until the train was nearing Midvale. He thought the collision occurred at 7:45 p.m., at which time the speed was about 10 miles an hour. He estimated that his vision was limited by the fog to about four car lengths.

Conductor Kirkman, of extra 582, stated that after train order No. 57 was made complete, at 6.47 p.m., he asked the dispatcher if any trains were following closely, and he heard the dispatcher call the operator at Lehi and ask about an extra west, but could not distinguish its number. After a short interval, the dispatcher informed him that there was "nothing by Lehi," and it did not occur to him to ask the dispatcher how close any following train might be. He delivered a copy of the order to the engineman and told him that there was nothing by Lehi. He stated that his train left Nash between 6.55 and 7.00 p.m. He had previously instructed Flagman Hoagland that before the train headed out on the main line he was to place a red fusee on the main track opposite where the rear end of the train was standing on the siding. He said he did not see the flagman do this, but after the switch had been closed and the train had started to leave Nash, he saw him throw off a 10-minute red fusee. Conductor Kirkman stated that when he entered the caboose he showed Flagman Hoagland the order and told him of the dispatcher's statement that no train had passed Lehi. From this time until the collision occurred the conductor was working at his desk. He was not aware of the dense fog encountered as the train approached Midvale, no remarks were passed between him and the flagman concerning it, and he did not know whether or not any fusees had been thrown from the cupola of the caboose between Nash and the point of collision. He estimated the average speed of the train between these points at from 15 to 18 miles an hour and he said that he had not felt any reduction in speed prior to the time of the collision. His first warning of the approach of extra 1186 was when he heard the popping of the release valves as the throttle was closed on the engine, when it was

not over two car lengths away, he got up and started for the door and at this time Flagman Hoagland called to him to look out, but the collision occurred before he had time to jump. He was familiar with rule 107, requiring the passing of a proceed signal from the rear of a train to the engineman when approaching stations, and depended upon the flagman to comply with it, but did not know whether or not he had done so. He stated that he considered the flagman to be a reliable man and that he was relying on him to do whatever might be necessary for the protection of the train. Conductor Kirkman also said that rule No. 105 would govern in a case where a flagman would be expected to throw off a fusee even though not required to flag in accordance with the flagging rule. Rule No. 105 reads as follows:

"105. Trains will be run under the direction of the conductor, but the engineer will be held equally responsible for the violation of any of the rules governing the safety of trains, and they must take every precaution for the protection of their train, even if not provided for by the rules. Pilot will be held equally responsible with conductor and engineer for the safety of the train."

Engineer Sloman of the ditcher, was riding in one of the outfit cars. He stated that about half a mile west of Riverton there was a bank of fog, but that the train soon passed through it and that when he got out of the wreckage after the accident there was no fog and he was able to see engine 582, approximately 25 car lengths distant.

Fireman Sorenson, of the ditching crew, who was riding in the caboose of extra 582, stated that while the conductor was getting the train order at Nash, Flagman Hoagland placed a red fusee on the main track, came back into the caboose and hung out the marker lights, then as the train was pulling out of the siding he saw him get some fusees from the rack and was positive that he dropped off a second fusee in the middle of the track when the caboose was just about on the main track, clear of the switch, after this the flagman got up in the cupola of the caboose, where he rode until the accident occurred. He saw no fusees dropped off after the train left Nash. The only conversation between the conductor and flagman was the conductor's remark that "there was nothing by Lehi." He was positive that there was no fog when he crawled out of the wreckage immediately after the accident.

Fireman Houghton, of extra 1186, stated that fog was first encountered just west of Riverton, but he thought Engineman Johnson worked steam for a considerable distance thereafter. He estimated that the train passed Riverton at a speed of 15 or 16 miles an hour, it was then 7.26 p.m. At no point did he see any indications of burning fusees and there was no indication of a train ahead until they saw the markers of a caboose

about two car lengths distant. At this time the train was drifting at a speed estimated by him to have been about 15 miles an hour, and he said that he saw Engineman Johnson apply the air brakes in emergency. He thought the engineman had shut off steam about two or three car lengths previous to seeing the markers of extra 582.

Conductor Lester, of extra 1186, stated that he looked at his watch as the train passed Lehi and it was 6.55 p.m., he estimated that it passed Nash at about 7.15 p.m. and that Engineman Johnson slowed down to 8 or 10 miles an hour in that vicinity, in observance of a slow order concerning falling rocks. He did not notice particularly what time it was when the train passed Riverton, but thought it was between 7.25 and 7.30 p.m. When about at the west switch at Riverton, a heavy fog was encountered, which extended to the point of accident, but he did not think Engineman Johnson had materially reduced the speed from the maximum of 25 miles an hour until about at Cutler's Spur, two miles east of the point of collision; it seemed to him that beyond that point the speed was reduced, although he noticed no application of the brakes, and he thought the train was moving at a speed of approximately 15 miles an hour when the collision occurred, which was at 7.45 p.m. He further stated that he had seen no fusees between Lehi and the point of collision, also that no proceed signals had been given from the caboose at any of the stations between those two points. He also stated that his flagman had thrown off three green fusees between Mesa and the point of collision, Mesa being a station between Lehi and Nash. Conductor Lester said that if he had been on extra 582 he would have done the same as Conductor Kirkman and have left it to the flagman to look out for the train while he was working at his desk. At the same time he said that the conductor is in charge of the train and that if he himself knew what the weather conditions were, and also knew that the flagman had not taken measures for the protection of the train, he would throw off a fusee himself. He also said that there was no rule which prescribes the manner of protecting a train which is being operated at reduced speed, as was the case when extra 582 was slowing down for the yard limit board at Midvale. He thought that if a red fusee had been thrown off west of Riverton the accident would not have occurred.

Flagman Brown, of extra 1186, stated that he saw no evidence of burning fusees when passing through Nash. He did not give any proceed signal to the engineman at Riverton because of the fog, but about at the west switch he threw off a lighted green fusee, at this time he looked at his watch and it was then 7.26 or 7.27 p.m. He threw off a total of three lighted fusees between Mesa and the point of collision. While going back to flag after the accident, he looked back toward his caboose and was able to see the markers a distance equal to one and one half times that between telegraph poles.

Dispatcher Leivsay, on duty at the time of the accident, stated that it was 6.45 or 6.46 p.m. when Conductor Kirkman called him from Nash and after receiving the order was told that there was nothing out of Lehi, although he said he thought Conductor Kirkman understood that a westbound extra was expected at that point. He said the operator at Lehi reported extra 1186 as passing that station at 6.55⁴ or 6.56 p.m.

Operator Sandmeir, on duty at Lehi, stated that at about 6.45 p.m. Dispatcher Leivsay called him on the telephone and asked if he could hear extra 1186 coming. He went to the window, but could hear nothing, and informed the dispatcher to that effect. He said he looked at his watch when extra 1186 passed and it was 6.55 p.m.

Superintendent Slattery stated that at about 11.00 p.m. on the night of the accident he examined engine 1186, found the brake valve in release position, and he said that in his opinion the brakes on extra 1186 had not been applied previous to the collision. Mr. Slattery also stated that rule 99 of this railroad was practically the same as the standard code rule, and that in addition there were rules 105 and 106. Rule 105 has been quoted previously; rule 106 reads as follows:

"106. In all cases of doubt or uncertainty the safe course must be taken and no risks run."

While there is no rule requiring flagmen to take steps for the protection of their trains in case they are operated at a reduced rate of speed, it is to be noted that the flagman of extra 1186 threw off three green fusees between Mesa and the point of collision, while the evidence also indicates that Flagman Hoagland, of extra 582, used two red fusees at Nash, apparently flagmen use fusees for their own protection whenever the circumstances are such that they consider their use justified. Circumstances of this character existed at the time of this accident, extra 582 being operated at a reduced rate of speed in a dense fog and thus being in a position to be overtaken by a following train. Under these conditions a proper regard for safety should have prompted Flagman Hoagland to take such measures as he considered necessary to protect his train and prevent such an accident as actually occurred. Had he thrown off a fusee either when the fog was encountered west of Riverton or when the speed of his train was reduced approaching Midvale, the crew of extra 1186 would have been notified of the proximity of a train ahead and the accident probably would not have occurred.

This accident was caused by the failure of Flagman Hoagland of extra 582 to exercise good judgment in the protection of his train when running at a reduced rate of speed in a dense fog. A contributing cause was the failure of Conductor Kirkman to pay sufficient attention to the operation of his

train to know that it was being properly protected under the circumstances, which existed at the time.

Flagman Hoagland was employed as a brakeman in 1912, his record was good. He had had about six years' previous experience on other railroads. Conductor Kirkman was employed as a brakeman in 1900 and promoted to conductor in 1904, his record was excellent. The members of the crews of the trains involved had been on duty periods varying from 8 hours and 15 minutes to 13 hours, after periods off duty ranging from 10 hours and 15 minutes to 2 months.

Attention has previously been called to the fact that rule 99 of this railroad requires flagging protection only when a train has been brought to a stop. This rule reads as follows:

"99. When a train is stopped by an accident, obstruction, or from other cause, the flagman must immediately go back with stop signals to stop any train moving in the same direction. At a point one-third of a mile from the rear of his train, he must place one torpedo on the rail, he must then continue to go back at least one-half of a mile from the rear of his train, and place two torpedoes on the rail, sixty feet apart (two rail lengths), when he may return to a point one-third of a mile from the rear of his train, and he must remain there until recalled by the whistle of his engine, but if a passenger train is due within ten minutes, he must remain until it arrives. When he comes in, he will remove the torpedo nearest to the train, but the two torpedoes must be left on the rail as a caution signal to any following train. At night he will also leave a green fusee burning on the track. If there is not a clear view for one-fourth mile to rear of train, the train must start before calling in the flagman, and move ahead at a speed of not less than four miles per hour until it reaches a point where the view is unobstructed for one-fourth mile in its rear.

If the accident or obstruction occurs upon single track, and it becomes necessary to protect the front of the train, or if any other track is obstructed, the same precaution will be taken.

All trains flagged must stop and pick up the flagman, and will not proceed until it is ascertained from him what the obstruction may be."

Superintendent Slattery stated that this rule is practically standard and that there were also to be considered rules 105 and 106 previously quoted. Rule 105, however, only provides in substance, that conductors and enginemen "must take every precaution for the protection of their train, even if not provided for by the rules," while rule 106 is still more general in its terms in requiring that in case of doubt the safe course must be taken. There is also paragraph 3 of circular No. 15, issued from the office of the general superintendent in 1907, which requires flagmen to see that fusees are properly lighted before throwing them off, but not saying when they are to be used, and paragraph 4 of the same circular which requires flagmen not to wait for instructions when the train needs protection. These paragraphs read as follows.

"3. When necessary to use fusees, to see that they are properly lighted before throwing them off of trains."

"4. They will obey signal from the engineer to protect the rear of trains as prescribed by Rule 14 (c), but never wait for this signal, or for instructions from the conductor when the train needs protection, and will never assume that such protection is not required or take it for granted that there is not another train following."

In none of these rules is there any definite requirement that trains moving at reduced rates of speed be given that protection which is essential if accidents of this character are to be prevented, particularly where no block signal system is in use. Rule 99 of the standard code of the American Railway Association specifically covers cases of this character by the following paragraph:

"When a train is moving under circumstances in which it may be overtaken by another train, the flagmen must take such action as may be necessary to insure full protection. By night, or by day when the view is obscured, lighted fusees must be thrown off at proper intervals."

While the years of experience of the employees at fault should have made them realize the necessity of affording proper protection to their trains, the responsible operating officials of this railroad are also at fault for their failure to include in their operating rules a provision similar to the paragraph quoted above from the standard code. While the rules of many railroads vary more or less from those contained in the standard code, practically all of them provide against the dangers arising from the operation of a train at a reduced rate of speed by specific provision for protection under such circumstances. Such a provision should be included immediately in the rules of this railroad. It

is possible that in this particular case its presence in the rule book would not have prevented the accident, but its absence creates a situation which is dangerous to its employees and the traveling public.

Had an adequate block system been in effect on this line, this accident could have been prevented.