

## INTERSTATE COMMERCE COMMISSION

### REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE PENNSYLVANIA RAILROAD AT ALTOONA, PA, ON NOVEMBER 29, 1925

DECEMBER 28, 1925

#### TO THE COMMISSION

On November 29, 1925, there was a derailment of a freight train on the Pennsylvania Railroad at Altoona, Pa, which resulted in the death of two employees and the injury of one employee

#### LOCATION AND METHOD OF OPERATION

This accident occurred on that part of the Pittsburgh Division extending between Pittsburgh and Altoona, Pa, a distance of 113.8 miles. In the vicinity of the point of accident this is a four-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The tracks are numbered from north to south as follows: 4, 3, 2, and 1, the train involved started to run away while on track 1, was diverted to track A, which parallels track 1 on the south, at BO block station, at which point one pair of wheels was derailed, and was running on this track when it was entirely derailed nearly opposite JK block station, approximately 1 mile distant. Approaching JK block station from the west the track is tangent for a distance of 5,900 feet, while the grade for the distance of nearly 12 miles between Gallitzin and Altoona is descending for eastbound trains, the greater part of this grade being between 1.5 and 2 per cent.

The weather was clear at the time of the accident, which occurred at 7:46 a. m.

#### DESCRIPTION

Eastbound freight train symbol VL-4 consisted of 58 cars and a caboose, hauled by engine 1282, and was in charge of Conductor Perry and Engineman Scheline. It departed from Sharpsburg, Pa, on the Conemaugh Division, at 5:45 p. m., November 28, and made several stops en route, including one at Conemaugh, on the Pittsburgh Division. It left Conemaugh at 1:30 a. m., assisted by helper engine 4587, started down the grade at Gallitzin, at which

point the helper engine was cut off, and had nearly reached GY block station, 33 miles from Altoona, when the train was stalled by an application of the brakes due to some cause which was not determined. After a delay at this point of 30 or 35 minutes the train proceeded, passed GY block station according to the train sheet at 7:41 a. m., got beyond control of its crew and ran away, being derailed at Altoona while traveling at a speed estimated to have been about 60 miles an hour.

The first mark of derailment was at a frog located just west of BO block station, and there were wheel-flange marks on the outside of the left rail and on the inside of the right rail, about 4 or 5 inches from the base of the rail, extending from this point to the point where the final derailment occurred. The engine and 39 cars were derailed, the majority of the cars being demolished. The employees killed were the engineman and fireman.

#### SUMMARY OF EVIDENCE

Conductor Perry said his train, which was what is known as a relay train, was received at Sharpsburg from the west, and that, as is customary with such trains, he received from the clerk the manifests and also a slip showing the number of cars in the train and the fact that the air brakes were 100 per cent operative, and he said he gave the original copy of this air-brake report to the engineman. No terminal tests are made with these relayed trains before departing, the instructions being to make a road test, which merely shows that the air is coupled through to the caboose. At Conemaugh, about 23 miles from Gallitzin, the engine was cut off for the purpose of taking on coal and cleaning the fire, another road test of the air brakes being made when the engine was recoupled. When the train reached Cresson near the summit of the ascending grade approaching Gallitzin, he left the caboose and went out on top of the train, and he said that prior to leaving the caboose he noted that the brake-pipe pressure was then between 65 and 70 pounds. Conductor Perry began turning up the retaining valves and he said that when the train started down the grade extending from Gallitzin to Altoona all the retaining valves on the train were turned up with the exception of four on the rear end of the train, and that in addition hand brakes were applied on six cars at the head end of the train. He stated the number of hand brakes to be applied is left to the judgment of conductors, and when at Conemaugh he had told the head brakeman how many hand brakes to apply on the head end of the train. It further appeared from Conductor Perry's statements that before starting down the grade east of Gallitzin a brake-pipe pressure of 85 pounds is required on the head end of the train, with not

less than 75 pounds on the rear end, if there is a pressure of less than 75 pounds on the rear end the engineman of the helper engine is supposed to sound a stop signal before cutting off from the train at that point. When the train passed AR block station practically at the summit of the grade, Conductor Perry heard a whistle signal, which he thought was sounded by the engineman of the helper engine, this signal indicating that it was all right for the train to proceed and he said he transmitted a proceed signal to the engineman.

No trouble was experienced in handling the train down the grade at a moderate rate of speed, and from his place in about the middle of the train he had not noticed any heavy applications of the brakes just before the train stalled, a short distance west of GY block station, although prior to this time he had noticed that the brakes were sticking on about six cars. After the train had stalled Conductor Perry turned down some of the retaining valves and found five or six which would not release. He then turned up the retainers again and bled the air from some of the auxiliary reservoirs, after which he went to a telephone for the purpose of notifying the operator that his train had stopped and giving the operator information concerning the number of hours his crew had been on duty, after which he started ahead and met the head brakeman, who said he had been arguing with the engineman about overcharging the train line, the engineman claiming that the train line had not been overcharged. He did not, however, go up to the head end of the train and talk with the engineman for the purpose of finding out what had caused the train to stall, having met the brakeman at a point about 25 car lengths from the engine, and he said that while talking with the brakeman the engineman took the slack three or four times, finally succeeding in starting the train, although the brakes still were sticking to some extent. Conductor Perry did not notice any application of the air brakes after the train started, and as it passed GY block station, at about which time he heard the engineman sound a whistle signal calling for hand brakes, he applied the hand brakes on two cars and shortly afterwards was able to apply the brakes on three more cars, and he said that while he did not know what was wrong he supposed at the time that the pumps on the engine were out of order. He estimated the speed of the train when passing BO block station to have been about 30 or 35 miles an hour and said he remained on the train, near the rear end, until it was derailed after the engine had passed JK block station. Conductor Perry further stated that when his train stalled west of GY block station he did not think that there was anything wrong other than the overcharging of the train line, although required when

a train has stopped on the grade for some unknown reason to turn down all retaining valves and make a road test, yet such a test was not made in this case

Head Brakeman Pincuspy said he left the engine at Cresson, previous to which the engineman had had no difficulty with the air brakes, and started back over the train, turning up the retaining valves on the first 20 or 22 cars, and that when the train finally stalled west of GY block station he had also applied the hand brakes on five cars at the head end of the train, he said that the train stalled with the engine working steam and the air brakes applied in emergency. After the train stopped he went over the cars toward the head end of the train, turning down the retaining valves and then turning them up again. he said he did not get any blow when he turned them down while the pistons remained out, causing him to think that the train line was overcharged, and when he reached the head end of the train he began bleeding the auxiliaries, not draining them, but, according to his statements, taking some of the strain off the brake shoes. In doing this, at which time the retaining valves were in the holding position, he did not bleed the auxiliaries on all the cars but would occasionally skip one or two cars, and he estimated that he opened about 12 or 15 bleed cocks, the pistons, however, would not release after this had been done. It also appeared from his statements that another reduction was made and that the brakes again applied in emergency. After bleeding the auxiliaries Head Brakeman Pincuspy returned to the engine and had an argument with the engineman, who had gotten off the engine and had started back along the train looking at the bleed cocks, he said this argument was as to reasons for the stalling of the train, that he told the engineman he must have overcharged the train line while the engineman said the trouble was located on the train and not on the engine. Brakeman Pincuspy said that when a train stops for unknown reasons the crew is supposed to locate the trouble, make a road test to see that the air is working through the train, and then wait until the air pressure is restored before proceeding. This procedure was not followed, however, in this case. According to his statements the flagman was recalled by the engineman, a proceed signal was given by the conductor, and the train was started with the brakes sticking throughout the train. Although the speed began to increase, yet he did not realize that the train was out of the control of the engineman until he saw the fireman on top of the first car in the train and at about the same time he heard the engineman calling for hand brakes, this being after the train had passed GY block station, and he said he then began applying hand brakes, working toward the rear end of the train, and had succeeded in setting the brakes on six

cars. He estimated the speed of the train to have been about 75 or 80 miles an hour immediately prior to the time the derailment occurred near JK block station. Head Brakeman Pincuspy further stated that while the train was standing at the point where it had stalled he did not notice any closed angle cocks or any leaks in the train line, and he was unable to offer any explanation as to why the train got beyond control after passing GY block station.

The statements of Flagman Strayer concerning the movements of his train prior to the time it reached Gallitzin brought out nothing additional of importance. He said the pressure according to the caboose gauge was about 70 pounds when the helper engine was cut off at Gallitzin and that the engineman of the helper engine whistled off at that time, he afterwards qualified this statement, however, to the extent of saying that he was busy with other duties and did not notice whether the engineman of the helper engine whistled for the train to be stopped or for it to proceed. He said the brakes were working properly from Gallitzin to the point where the train stalled and that he then went back to protect his train. When recalled he returned to the caboose and glanced at the gauge, but he said he was unable to say whether or not it indicated there was any brake-pipe pressure. He then rode in his usual position, on the forward platform of the caboose, and he said he did not hear anything to indicate that the brakes were sticking, neither did he hear anything to indicate that the air brakes had been applied by the engineman, and finally when the speed began to increase he went inside the caboose and reached for the release valve. Finding no air at that point he went back to the forward platform and broke the air hose between the caboose and the rear car and he said that there was nothing to indicate the presence of any air in the train line. He did not open the conductor's valve, which was located on the outside of the caboose, saying that he reached for the first available means of opening the train line. When asked to explain why there was no air in the train line he suggested that it might have been due to the action of some one in closing an angle cock or to the fact that the pumps on the engine might have been out of order. Flagman Strayer further stated that when the train was in the vicinity of GY block station, at which time it was running away, he had looked ahead but had not seen any fire flying from the brake shoes.

Engineman Bertei, in charge of helper engine 4587, stated that when he coupled to the rear of the train at Conemaugh the gauge showed a brake-pipe pressure of 62 pounds. The engine was cut off at NY block station, 11 miles west of Gallitzin, for the purpose of taking water, and when it had recoupled to the train the pressure

was once more pumped up to 62 pounds. He said that 62 pounds was the pressure at the time the train stopped at MO block station, about 2 miles west of Gallitzin, and that when the train finally reached the summit of the grade at Gallitzin the same brake-pipe pressure was registered and that he sounded one blast on the whistle as a stop signal, at the same time gradually closing the throttle. The speed of the train was reduced and he thought it was going to be brought to a stop, but his statements indicated that his engine was cut off and that train VL-4 started down the grade without having the required brake-pipe pressure, which he said should have been between 75 and 85 pounds. Engineman Beter further stated that the automatic brake had been used in making the various stops en route, that the brakes applied and released properly, and that in each case the brake-pipe pressure was pumped up immediately. Fireman Fenwick said he had not noticed the brake-pipe pressure until Engineman Beter sounded a stop signal, at which time the pressure was slightly less than 65 pounds, and that he did not see any member of the train crew when he cut off the helper.

Operator Sease, on duty at GY block station, said train VL-4 was moving at a speed of about 25 miles when the engine passed that point. He did not see any fire flying from the wheels nor did he hear the engineman calling for hand brakes, but he said there were two members of the crew on top of the train setting the hand brakes, one of these men being located on about the fifteenth car from the engine while the other apparently was about 30 or 35 cars back of the engine. Operator Sease did not realize at this time that the train was beyond control, but as a matter of precaution he notified the operator at BO block station to be watching for the train.

Operator Chappell, on duty at BO block station, said he had intended to detour train VL-4 from track 1 to track A, and this arrangement was not changed. As the train went through the crossover the engine seemed to sway to one side but righted itself, and he did not know until some time afterwards that any portion of the train had been derailed at that point. He estimated the speed of the train to have been about 50 miles an hour, and said that there were two men on top of the train applying hand brakes. Operator Chappell further stated that the only fire he saw was coming from the driving-wheel brake shoes and that the tires on the driving wheels seemed to be red-hot.

An eyewitness who was standing at JK block station said that as the train approached that point he could see that the pony-truck wheels were derailed, while fire was flying from under every car in the train. He estimated the speed of the train to have been about 35 or 40 miles an hour.

L. F. Axe, assistant foreman car inspector, said that as soon as he reached the scene of the accident, at about 8 15 a m, he examined the brakes on the last 19 cars and the caboose and found that only five of the brakes were still holding, the balance having released. Later a terminal test was made, and it was found that all the brakes applied properly except in the case of one car on which the brakes were cut out and another on which the brake was inoperative, on account of a leaky cylinder-packing leather, this test was made from a brake-pipe pressure of 70 pounds. Car Inspector Brannen stated it was about 9 30 a m, when in company with Mr. Axe and one other employee, a yard engine was coupled to the rear of the 19 cars and caboose, the train line charged to 70 pounds brake-pipe pressure, and a 20-pound reduction made, and he said that on examining these cars they found four on which the brakes were not working. Two of these were the cars previously referred to by Mr. Axe, the other two involving release valves which had stuck in the open position. These were closed and the test was then repeated and on this occasion there were only two cars on which the brakes did not apply. These two employees were asked for their opinion as to what caused the train to run away, and Mr. Axe said from what he had seen he judged that the train did not have sufficient pressure when coming down the grade, otherwise there would have been an in the auxiliaries when they were examined after the occurrence of the accident, while the brakes on all of the cars which were not damaged would have remained applied as it was, while the air was still applied on several of the cars, yet it was just barely holding.

The air-brake test which was made of the 19 cars and caboose which remained on the rails after the occurrence of the accident showed that in addition to the two cars on which the brakes were inoperative, as noted by Assistant Foreman Axe, there were two other cars on which the piston travel was  $8\frac{1}{2}$  inches, one on which the piston travel was  $9\frac{1}{2}$  inches, and one on which the travel was  $10\frac{1}{2}$  inches. It was also noted about 30 or 35 minutes after the occurrence of the accident that there were only five cars on which the pistons were out of the cylinders, one of these being the car on which the piston travel was  $10\frac{1}{2}$  inches.

Chief Car Inspector Walker said he understood that train VL-4 was assembled at Columbus and relayed at Dennison, Ohio, and again relayed at Sharpsburg, and that at the two stations last named the instructions, in effect, were to make only a road test of the air brakes in the case of a relayed train, should a train be assembled at Sharpsburg, however, it would receive a terminal test. Mr. Walker also said that the air-brake instructions provided that on starting down grades a brake-pipe pressure of at least 85 pounds should be carried on the engine, in the case of a light-tonnage train, such as

the train involved in this accident, and in case a train stops for a reason unknown to the crew the train is to remain at that particular point until the crew is satisfied that the brakes are in condition to control the train, after turning down the retaining valves and releasing the brakes, the valves are to be turned up again and the brake-pipe pressure restored before proceeding. He considered it to be practical for trains of the size involved in this accident to start down the grade without stopping at the summit for a test either of the air brakes or of the retaining valves, provided it is known that the brakes are in good condition and also provided that the required pressure is maintained, in fact, he stated that the only difficulty experienced on this grade was due to trains breaking in two or stalling due to the extra attention paid to keeping up the brake-pipe pressure and keeping down the speed. He further stated no retaining-valve tests are made in this particular territory other than to see that the pipes are intact and coupled to the valves and that the valves appear to be in working order.

Assistant Trainmaster Gerald, located at Sharpsburg, said that in the case of relayed trains the clerk who handles the waybills secures information as to the number of operative air brakes either from the conductor or the yardmaster, he then writes down this information on a blank form and turns it over, together with the waybills, to the conductor who is to have charge of the train when it leaves Sharpsburg. No terminal or retaining-valve tests are made on such trains, the conductor of the incoming train being expected to know of any inoperative brakes and to furnish information concerning them. If there are any cars on which the brakes are inoperative, it is provided in the instructions that these cars are to be cut out of the train and repaired before being forwarded to their destination. In this connection it might be stated that the car inspectors at Sharpsburg shopped one car on account of a broken arch bar and another car on account of a broken truss rod.

Train VI-4 had been made up at Columbus, Ohio, on the afternoon of November 27, at which time a terminal air-brake test was made by car inspectors. These inspectors stated that the air brakes on the train were in good condition, with a piston travel of between 6 and 8 inches, but that they did not make any test of the retaining valves other than to see that they were open. These inspectors also stated that a road test was made after the engine was coupled to the train for the purpose of determining that the air brakes were working through to the caboose. The terminal test was completed at about 5:45 p. m. and the road test at about 6:20 p. m.

Machinist Gulchist, located at Sharpsburg, said he had worked on the air brakes on engine 1282 on November 27, prior to its depari-

ture on train VL-4 on November 28. The reservoir pressure was all right but he changed the brake-pipe pressure setting from 75 pounds to 70 pounds. He said he had a report that the air gauge registered improperly, but on testing it he found it to be only  $1\frac{1}{2}$  pounds out of the way, and therefore did not make any repairs. He did, however, find that the piston travel of the driving-wheel brakes was about 7 inches and said he adjusted this travel to about  $5\frac{1}{2}$  inches. He did not notice anything wrong with the operation of the pump and said he considered the air-brake equipment on the engine to be in good condition. Examination of engine 1282, which is of the 2-8-2 type, showed that the driving-wheel tires had been badly overheated, four of them being loosened. Careful examination of such parts of the air-brake equipment of the engine as could be tested failed to develop anything wrong with the exception of a slight leak to the atmosphere at the rotary valve when in the release position, but in this case the valve handle and stem bore evidence of having been struck by something when the engine was wrecked. The work reports show that considerable trouble had been experienced with the air compressor and that finally on November 24 it had been removed and another compressor applied which had been previously inspected and tested.

#### CONCLUSIONS

This accident was caused by failure to know that the air-brake system was in proper condition to control the train before allowing it to proceed from the point at which it had stalled on a heavy descending grade, for which Conductor Perry and Engineman Schelue are primarily responsible.

The investigation developed that after the train had stalled, at a point where the grade was about 170 per cent descending, the only thing done by the members of the crew was to endeavor to release the brakes so as to allow the train to proceed, no attempt being made to ascertain the nature of the trouble responsible for the stalling of the train. The engineman had to take the slack several times before he finally succeeded in starting the train, at which time many of the brakes still were sticking, and it appears that after the train had once been started it never again was under the engineman's control. The reason for the stalling of the train was not definitely ascertained. However, all the evidence indicates that the emergency application which stalled the train was due either to undesired quick action of a triple valve at some point in the train or to an open brake pipe probably caused by a burst hose. The theory of an overcharged brake pipe, advanced by Brakeman Pincuspy and Conductor Perry, is not tenable.

Conductor Perry turned down a few retaining valves and bled a few auxiliaries at the rear of the train, and then went directly to the telephone, from which point he proceeded toward the head end of the train and met the brakeman at a point about 25 car lengths from the engine. While Conductor Perry was talking with the brakeman at this point, the engineman was taking slack on the train in an effort to start it, the brakes still sticking and finally got it moving while the conductor and brakeman were still engaged in conversation. No member of the train crew had an opportunity to know anything about the condition of the train behind the twenty-fifth car from the head end. After the train once started it was absolutely beyond control. When Flagman Strayer mounted the caboose after being called in he did not notice the brake-pipe pressure indication on the air gauge, but when the speed of the train increased unduly he broke the air hose between the caboose and rear car and found no air in the brake pipe.

This accident very forcibly calls attention, not only to a woeful lack of rule observance on the part of the responsible members of this train crew, but also to lack of adequate safeguards by the Pennsylvania Railroad Co. to insure that trains shall be safely operated on this descending grade.

In the first place, this train broke over the summit of the grade with the rear end not charged to the pressure required by rule. The nonchalance with which this fact was treated when attention was called to it by the designated signal from the engineman of the helper engine indicates that the rule is more honored in its breach than in its observance. Next, this train was moved from Columbus, Ohio, to the point of accident, a distance of approximately 300 miles, passing through two established terminals at which the engines and crews were changed, without any test of the brakes other than the ordinary road test to determine that the brake pipe was open throughout the train. No information as to the efficiency of the brakes on this train was had by the crew which took charge of it at Dennison or at Sharpsburg. It was particularly essential that full information about brake conditions should have been furnished the crew which took the train at Sharpsburg, the last terminal passed before descending the grade on which the accident occurred. The evidence is that it is the regular practice of the Pennsylvania Railroad Co. to operate trains of this character as this train was operated. This is a bad practice which should be corrected.

The test which was made of the brakes on the cars which remained intact after the accident disclosed brakes with unduly long piston travel, and at least two that were wholly inoperative. It is reason-

able to assume that this was typical of the brake conditions on the entire train, a state of affairs which would not have existed had a proper brake test been made at Sharpsburg and the necessary repairs made.

It is a regrettable circumstance that serious accidents such as the one herein considered often seems to be the only means of effecting a correction of unsafe practices of long standing. While the operation of trains on Gallitzin grade is nominally by means of air brakes, it has long been the practice not only to permit but to encourage the use of hand brakes in connection therewith, the number of hand brakes used being left to the judgment of enginemen and conductors in charge of trains. The control of trains on this grade, therefore, is partly by air brakes and partly by hand brakes. This practice, like all practices which involve a division of responsibility, leads to a reliance upon one method to correct deficiencies in the other, leading to the result that, sooner or later, both methods will inevitably fail when most urgently needed.

The lesson to be learned in this connection is that if trains are to be controlled by means of air brakes they must be so controlled absolutely and without reservation. This means that the air brakes must be maintained in an efficiently operative condition at all times, and employees must be properly instructed in their use. The converse is true of the hand-brake method. Both methods can not safely be used together, and in this connection it may be proper to observe that the use of hand brakes to control the speed of trains is unlawful.

The employees involved were experienced men. At the time of the accident they had been on duty about 14 hours after about 10 hours off duty, with the exception of Head Brakeman Pincuspy, who had been off duty about 24 hours.

Respectfully submitted

W P BORLAND, *Director*