In Re. Investigation of an Accident which Occurred on the Oregon-Washington Railroad & Navigation Company's line, near Biggs, Ore., Mar.10,1916.

May 15, 1916.

On March 10, 1916, there was a derailment of a freight train on the Oregon-Washington Railroad & Navigation Company's line near Biggs, Ore., which resulted in the death of 2 employees and the injury of 1 employee. The investigation of this accident was made in conjunction with the Railroad Commission of the State of Oregon, and as a result of this investigation the Chief of the Division of Safety submits the following report.

The accident occurred on the Shaniko Branch, extending from Biggs to Shaniko, at a point about 3 miles east of Biggs. This is a single track line and trains are operated by time-card and train orders. From Klondike to Gibson, a distance of 8.9 miles, the grade is descending for westbound trains practically the entire distance, most of it being from 1% to 2%, while at two places it is about 2.25% for a distance of 2,000 feet at each point. From Gibson to Biggs, 4.9 miles, the greater part of the grade is in excess of 3%, ranging from 3% to 3.47%. At the point of accident the track is on a 14-degree curve extending to the left for westbound trains, the maximum superelevation being 3 degrees. The track is laid with 60 and 75-lb. rail, with from 18 to 20

ties under each rail. Tie-plates and rail-braces are used, and the track is in good condition for branch line service. The maximum speed allowed for freight trains between Klondike and Gibson is 12 miles an hour, and 10 miles an hour between Gibson and Riggs. The weather at the time was clear.

Westbound freight train extra 142 consisted of 8 loaded cars and a caboose, hauled by locomotive 142, and was in charge of Conductor Dalrymple and Engineman Williamson, and was derailed at about 2:25 a.m. while rounding the 14-degree curve. At this point the 5 cars behind the first car were derailed, thrown down the embankment and demolished. The 2 rear cars and the caboose remained on the roadway, with all the wheels off the rails except the rear trucks of the caboose. The locomotive and the first car of the train traveled an additional distance of about 3,700 feet before being derailed on a curve to the right of 10 degrees, both the locomotive and the car being badly damaged.

Engineman Williamson stated that in stopping at Gibson he made a full service application of the air-brakes and left the brakes set while the train was being inspected. The stop at this point was made without the use of hand-brakes, the retainers having been turned up leaving Klondike. After he had oiled the locomotive the fireman told him they were ready to go. Engineman Williamson whistled off, released the brakes, and then waited until the full pressure had been pumped up, the train-line pressure at the time of de-

porture being nearly 75 pounds, while the main reservoir pressure was 85 pounds. He then worked sufficient steam to get the train started, leaving Gibson without any of the brakemen having told him whether or not all of the air-brakes were working. As soon as the speed increased he made an application of the air-brakes. This first application was made at a point about ¼ of a mile from Gibson, and was a 15-pound application, and when at a point nearly 1 mile from Gibson was followed by an additional application of 10 pounds, the brakes not being released after the first application. At the time the first application was made the speed was about 7 miles an hour, and it was about 5 or 6 miles an hour when the second application was made, at which time the two brakemen and the conductor were on top of the train setting hand-brakes with their clubs. Enginemen Williamson said that he could not see the men on the rear of the train, but was watching the head brakeman setting the brakes on the first car, and when he had apparently finished and was starting back toward the second car he released the air-brakes, at which time the speed was about 6 miles an hour. After releasing the brakes he placed the brake valve in the full release position and then noticed that the train-line pressure was close to 70 pounds. He then saw the hands on the air-pressure indicator going down, but at first he did not pay much attention to this, saying that usually when the air started to go back in the train the hands on the indicator would drop a

little. When the indicator showed that the pressure had dropped about 10 pounds he thought the train-line had broken, and then placed the brake valve in the lap position, at which time the train-line pressure was about 60 pounds. Just as he did so he saw that it was the main reservoir pressure which had gone down, and he said that he could hear the air blowing immediately under the cab of the locomotive. The reservoir pressure had decreased about 40 pounds and the speed of the train was increasing, so he placed the brake-valve in the emergency position, and as he did so sounded one long blast of the whistle and told the fireman to jump off, that he thought the train was running away, and that he had no air. The fireman said that they were not going very fast, and that probably the engineman could stop the train. Engineman Williamson stated that he then tried twice to reverse the locomotive, but that the reverse lever did not hold, the quadrant being a little oily. At this time the speed was such that he could not pull it back again, and he again told the fireman to jump. Engineman Williamson also stated that on account of having just released the brakes there had not been time to recharge them, and if the brakes had been recharged he felt sure that with the amount of train-line pressure carried he would have been able to stop the train. Engineman Williamson said that in his opinion the accident was caused by the breaking of the main reservoir air-pipe. With regard to the reverse lever slipping out of the notch in the quadrant, he stated that he had never had this trouble be-

fore, but that on this trip it had worked out of the notch two or three times when the locomotive was working heavily. He further stated that he had been running on this branch about two months; he had never had any other experience on a mountain railroad.

Head Brakeman Strong stated that the train was doubled up the hill into Sandon, the first station east of Klondike. When the train was coupled together he coupled the air-hose himself and cut in the air, but no test of the air-brakes was made at this point. He also turned up the retainer valves on all of the cars when leaving Klondike for Gibson. He stated that it was the custom to stop at Gibson by use of the air-brakes and to walk along the train to see if the pistons was out not less than 4 inches nor more than 8 inches. One man would start from one end of the train and another man from the other end, and after they met a proceed signal would be given from the rear end. When the stop was made at Gibson no separate test of the air-brakes was conducted, the engineman stopping the train and leaving the brakes applied. Brakeman Strong stated that he then walked back on the engineman's side of the train and examined 4 or 5 cars, finding the pistons to be out on all of them. When about the middle of the train he met either Brakeman Stimpson or Conductor Dalrymple, who was on the opposite side of the train and had been examining the cars, working forward from the rear of the train. A proceed signal was then given from

the opposite side of the train, either by Conductor Dalrymple, or by Brakeman Stimpson, who was killed in the accident. Brakeman Strong also stated that he did not look over the train after the brakes were released to observe the piston travel, and he did not know how long the train had stopped at Gibson, but thought it was 3 or 4 minutes. As soon as the train left Gibson they began applying hand-brakes. He also felt the air-brakes being applied, but did not notice how fast the train was traveling at that time. This application reduced the speed to about 6 or 8 miles an hour, and he said that the train then seemed to get a start and to travel faster and faster, until it was running away. When the train had proceeded about three-quarters of a mile the enginemen whistled for brakes. At this time all of the hand-brakes were set. Two of them did not work well, but he did not remember on which cars they were located. At first he did not think the train was running away, but when he noticed the speed he thought that it was about 15 miles an hour, and possibly more. Head Brakeman Strong stated that he had been in the employ of the company since February 11, 1916, practically all of which time he had spent on the Shaniko Branch. He had been a brakeman on other roads since 1912, and had had a few months' experience on mountain grades on the Chicago, Milwaukee & St. Paul and Northern Pacific Railways.

Conductor Dalrymple stated that the retainers were usually turned up when coming into Klondike, with the exception of the retainer on the caboose, which was turned up at Gibson, and while he personally did not know what they had been

turned up on this occasion he had complete confidence in the brakemen, and thought the retainers were turned up, saying that he could smell the heat from the wheels and could also tell by the way the train was traveling. When at Gibson, the train was inspected for the purpose of observing the piston travel, and he assisted in this, working forward from the rear of the train; at the time of this inspection the retainers were turned up. He stated that if the piston travel was over 7 or 8 inches the slack would be taken up. After the inspection had been completed a proceed signal was given by Brakeman Stimpson. Conductor Dalrymple said that the usual air test at Gibson is for the enginemen to keep the brakes applied until the train is inspected, then to wait until the air is pumped up before proceeding. In this particular case he thought the train was at Gibson about 5 minutes before it proceeded, and when his attention was called to the fact that his delay report showed his train to have been at Gibson 15 minutes he said that this was put down after the accident and that he was just guessing at the time. Conductor Dalrymple said that after leaving Gibson he set two hand-brakes on the rear of the train, set the caboose brake, and turned up the retainer on the caboose. While in the caboose he noticed that the air-pressure was 80 pounds. He then went out on top of the train, and while there felt what he thought was an ordinary application of the air-brakes, and he stated that it reduced the speed from about 10 miles an hour, when the application was made, to about 5 or 6 miles an hour. He did not feel any application of the brakes other

then this one application, saying that after the brakes were released the speed of the train kept increasing and he was wondering why the brakes were not again applied. Conductor Dalrymple also said that before the brakes were released he and the two brakemen were on top of the cars and had set the hand-brakes, and that before the enginemen whistled for brakes the two brakemen had doubled on the hand-brakes on the head end of the train, and the head brakeman then came back and doubled with him on the hand-brakes on the rear cars. He did not notice what the speed was when the enginemen called for brakes, as he was busy setting the hand-brakes. He also said that he noticed nothing wrong with the hand-brakes. Conductor Dalrymple had been running this train for about a week. He stated that in 1910 he had been a brakeman on this branch for a period of about 9 months, and since that time had often been over it as an extra conductor. He also said that Brakeman Stimpson had been on this run 21 days, that he was a good brakeman and understood his business.

Assistant Superintendent Coykendall stated that the practice was to set all hand-brakes as soon as the train started from Gibson, and as soon as an application of the air-brakes was made the train crew would tighten the hand-brakes, taking up the slack caused by the application of the air-brakes. If this was done properly the hand-brakes would be applied as tightly as if by a service application, and a train could go down the hill without a further application of the

air-brakes being made. In this case he did not think the hand-brakes were set when starting down the hill.

Traveling Engineer Rifer stated that he took off the caps of three of the triple valves and tested two other cars, and he found that the braking equipment on the train was first-class in every particular. All of the brake-shoes on the engine and tender were blue and burned, indicating that the brakes had been in working order at the time of the accident. The retainer on the first car behind the locomotive was half way up and the triple valve in full service application, but the brake-shoes and wheels did not show any signs of high braking power. On the second car the triple valve was in service lap position, while the retainer could not be found; the third car had the retainer half way up, with the brake chain wound around the brake shaft; the fourth car had the retainer up and the triple in service position; the fifth car had the retainer turned up, while the triple valve could not be reached; on the sixth car the retainer and triple could not be located, while on the seventh car the retainer was half way up and the brake-chain wound around the brake shaft. On each of these last six cars the wheels were blue and the brake-shoes red, indicating that the brakes had been in working condition. A test of the 5th car showed that the piston travel was 6 inches, and the retainer held for 1 minute 30 seconds after the release of the brakes. On the caboose the piston travel was 8 inches, and

the retainer held 1 minute 15 seconds after release. Mr. Rifer also stated that he found several broken pipes on the engine, but these apparently were broken in the accident. The breaks were new and had the appearance of having been broken off instead of pulled out, with the exception of the main reservoir pipe on the rear of the tender, which had the appearance of having been pulled out. This pipe was pulled out at the threads, however, and could have been pulled out when the tender became separated from the tender frame. If this particular pipe had broken while coming down the mountain, at a time when the brake-valve was in release position, the brakes would have been applied automatically. He also said that he found the pipe broken from the auxiliary reservoir on the engine underneath the cab floor on the engineman's side, and he said that if this had broken while the train was coming down the mountain, with the brake-valve in the release position, it would help drain the main reservoir and overcome the leak, helping to apply the air-brakes. There was nothing which he could find to explain the statement of the enginemen about the air leaking away after the brakes were released, and he said that any air pipe which broke and allowed the air to escape would cause the brakes to apply. He did not think the enginemen lost control of the train on account of defective equipment, but that the train was traveling too fast when it struck the heavy part of the grade, before they began to apply the hand-brakes, and that when the brakes were

all applied and the engineman began to release the air, the speed of the train increased and could not be controlled. The inspection record of locomotive 142, made on March 8, showed the brakes to be in good condition, while the main reservoir pressure was 90 pounds and the brake pipe pressure 70 pounds. Mr. Rifer stated that he had ridden with Engineman Williamson on the Shanika branch two or three days prior to the accident, and he considered him to be a competent man for service on this branch.

Roundhouse Foreman Quinn stated that on February 16, 1916, a practically new air pump was applied to locomotive 142, this pump being tested on the day it was applied. The gauge and brake valve were tested on January 5th, and the triple on January 6th, while the brake cylinder was cleaned on January 6th. In examining the locomotive after the accident he found the cut-out cock in the train-line, under the engineman's valve, shut tightly, and he thought it was closed by the engineman striking it with his foot when trying to reverse the locomotive.

Car Foreman Hulls said that in looking over the wreckage he found the brake-rod on the first car tied up with wire. This would permit the entire piston travel, and would result in the brake on this car not amounting to much and would also affect the hand-brake on one end of the car. He stated that the wheels of all the cars, except the first, were blue.

Mr. A. W. Perley, a special representative of the

mechanical department, said that according to the engineman's statement there was 70 pounds train-line pressure when the engineman heard the explosion under the cab, at which time the brake valve was in the full release position. He thought that the reservoirs surely must have been charged to 60 or 65 pounds, and would take only 7 or 8 seconds to recharge the train of 8 cars. He, therefore, was of the opinion that if any of the pipes on the engine had broken the air-brakes would have been applied automatically.

Mr. J. T. Langley, assistant superintendent of motive power, stated that he found the retainer down on the car next to the caboose, and he thought there was one other car in the wreckage on which the retainer was down. With reference to the cause of the accident, it was his opinion that, after the enginemen released the brakes, the train was allowed to attain a rate of speed higher than it should have traveled, and that with the brake-pipe pressure carried the engineman should have been able to stop the train, regardless of the broken air pipe, had not the speed been excessive.

On account of the badly damaged condition of the locomotive hauling this train, and the further fact that all of the cars except two were practically destroyed, no proper test could be made to determine the efficiency of the air-brake equipment. The evidence indicates, however, that the air-brakes on the first car were of doubtful efficiency, and that, with one exception, all of the hand-brakes were working,

while the employees state that they were applied, brake clubs being used for the purpose, and the burned condition of the car wheels and the brake-shoes is evidence that the brakes had been applied. If the hand-brakes on this train had been properly applied, however, as soon as it left Gibson, and if the enginemen's statement is correct that after placing the brake valve in full release position the train line was recharged to nearly 70 pounds, then the speed limit of 10 miles an hour could have been observed and the train operated down the mountain in safety.

It is believed that this accident was caused by the crew in charge of this train permitting it to attain a speed in excess of the 10 miles an hour prescribed by rule, and that it got such a start that they were unable to control it by using both the hand-brakes and air-brakes.

Engineman Williamson had been employed by the Southern Pacific Company as a fireman for about four years, resigning in August, 1905. In October, 1905, he entered the service of the Oregon-Washington Railroad & Navigation Company as a fireman, being discharged in September, 1906, for neglect of duty. He was reinstated November 28, 1906, and in 1912 was promoted to engineman. His record was good. Conductor Dalrymple was employed for three years by the Northern Pacific Terminal Company as a wiper. In 1907 he entered the service of the Oregon-Washington Railroad & Navigation Company as a wiper, being promoted the same year to switch

engine fireman, and then to road fireman. In 1908 he resigned, and in 1910 was reemployed as a brakeman, being promoted to conductor in 1914. His record was good. Head Brakeman Strong was employed on February 11, 1916, and had a clear record. In the preceding 5½ years he had been employed eight different times by six different railroads. Rear Brakeman Stimpson was employed as a brakeman on December 3, 1915, and had a clear record. He had had about four years' experience with other roads.

At the time of the accident these employees had been on duty about 15½ hours, after over 14 hours off duty.