

## AN ACCIDENT ON THE LINE OF THE OREGON WASHINGTON RAILROAD & NAVIGATION COMPANY, UNION PACIFIC SYSTEM, AT ATTALIA, WASH., ON AUGUST 14, 1933.

On August 14, 1933, there was a derailment of a freight train on the line of the Oregon-Washington Railroad & Navigation Company, Union Pacific System, at Attalia, Wash., which resulted in the death of 1 trespasser and the injury of 6 trespassers, The investigation of this accident was held in conjunction with a representative of the Department of Labor and Industries, State of Washington.

### Location and method of operation

This accident occurred on the Sixth Subdivision of the Washington Division, which extends between Spokane, Wash., and Umatilla, Ore., a distance of 184.5 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time table, train orders, and an automatic block-signal system. The general compass directions are north and south, but time table directions are east and west and these latter directions are used in this report. The accident occurred at the frog of a trailing-point switch located within yard limits 3,675 feet east of the station at Attalia; approaching this point from the east, the track is tangent for a distance of 7,698.3 feet, followed by a 4 degrees curve to the left 1,164.6 feet in length, tangent track for a distance of 890.1 feet, and a 3 degrees curve to the right 1,621.1 feet in length, the frog at which the derailment occurred being located on this latter curve 58.5 feet from its eastern end. The grade at the point of accident is 0.41 percent descending for west-bound trains.

The track is laid with 90-pound rails, 33 feet in length, with an average of 18 treated ties to the rail length, double-spiked on the inside of the rail on curves. It is tieplated on all ties except under rail joints, has five or six rail anchors per rail length, and is ballasted with gravel to a depth of 6 inches; the track is well maintained.

The weather was clear at the time of the accident, which occurred about 8:10 a.m.

### Description

West bound freight train no. 251 consisted of 83 cars and a caboose, hauled by engine 5400, and as in charge of Conductor Howard and Engineman Ferring. This train departed from Ayer, the initial terminal, for this crew, 51.7 miles east of Attalia, at 6 a.m., 3 hours 5 minutes late, and was derailed at Attalia while traveling at a speed estimated to have been between 25 and 30 miles per hour.

The engine and first nine cars were not derailed, but the forward truck and the leading pair of wheels of the rear truck of the tenth car were derailed. The following 21 cars were entirely derailed and, stopped in various positions within a space of 347 feet, some of them being destroyed and others badly damaged. The balance of the train remained on the track and sustained no damage.

## Summary of evidence

Engineman Ferring said his train entered the curve on which the accident occurred at a speed of about 30 miles per hour, but that the speed had been reduced to about 25 miles per hour when he felt the engine jerk and on looking back he observed that the train had parted and also saw cars derailing, this being his first intimation of anything wrong. Engineman Ferring also stated that there was a light breeze blowing from his side and that he had had no trouble in seeing the greater portion of the train at points where physical conditions permitted, and he was able to see back along the entire length of the train while it was rounding a curve about 5 miles east of Attalia. He did not know whether it was possible to look back along the left side of the train, as the fireman and head brakeman had said nothing about it, but he had noticed them looking back on several occasions.

Fireman Rambo stated that he had looked back frequently, along the left side of the train after leaving Ayer, the last time he remembered looking back having been on a curve several miles east of Attalia; he did not see any smoke or anything that would indicate there was a hot box on any of the cars, but said he could not see more than 12 or 15 car lengths on account of the visibility being affected by dust. Fireman Rambo knew the rules specifically required him to keep a sharp lookout towards the rear end of the train, especially around mines, but he was also required to maintain a lookout ahead while entering yard limits where the engineman's view might be obscured, as in this case, and for this reason he did not pay particular attention to the movement of the train as it neared the point of accident.

Head Brakeman Cramer stated that when the brakes were being tested at Ayer he examined the brakes, pistons, etc. on the first 25 or 30 cars and noticed no defects. He rode on top of about the sixth car from the engine between Ayer and Walker Pit, 31 miles east of Attalia, from Walker Pit to Sheffler, 1.9 miles, he was in the head car, and from Sheffler to the point of accident he rode on the engine and looked back several times from both sides of the gangway, but saw nothing out of the ordinary, although at times he could see back only 15 or 20 car lengths on the left side of the train due to the sand and dust being stirred up. The last time he looked back along this side of the train was on the tangent track, approximately 1 1/2 miles east of the point of accident, and he thought that if a journal box on the tenth car had been blazing at that time he would have seen it. Immediately after the accident he went back to this car and observed that a journal was missing, but the broken end of the axle was not red hot and was not smoking.

Middle Brakeman Carney stated that he also rode on about the sixth car from the engine from Ayer to Walker Pit, and after setting out some cars at the latter point he stood on the left side of the train, watching it for its entire length while it was departing, and there was no indication of a hot box. When the caboose reached him he boarded it and rode on the left side of the cupola, but could only occasionally see along the train for its full length. As the train was entering the curve to the left east of the point of accident he noticed what appeared to be a puff of smoke, followed by an unusual cloud of dust. Upon looking back he saw marks on the ties and after going to the rear door of the caboose to ascertain if they were fresh marks he started to tell the conductor that apparently an arch bar was down, but the brakes applied before he could do so. He estimated the speed at the time of the accident at 25 or 30 miles per hour. Prior to the accident he had not seen or smelled

anything to indicate there was a hot box in the train but after the train stopped he observed several small fires east of the caboose and when he went ahead to the point of derailment he found burning waste at the frog of the switch.

Rear Brakeman Walden stated that he watched approximately 50 cars of the rear portion of the train as it was departing from Ayer and there were no brakes sticking or other defects noticeable. After leaving that point he rode on the right side of the cupola of the caboose and at various points he could see the full length of the train; there was no unusual condition existing on that side, although after passing Humorist, about 6 miles east of the point of accident, the visibility was obscured by dust. As soon as the train stopped after the accident he went back to flag and after placing torpedoes he extinguished the fire at five or six piles of burning waste and also found a journal box wedge about 15 pole lengths east of where the caboose came to a stop; this wedge was hot when he found it.

Conductor Howard was occupied at his desk most of the time between Walker Pit and the point of accident, although just before reaching Humorist he looked ahead on tangent track along both sides of the train, but the train was traveling between 35 and 40 miles per hour and he could only see clearly for about 10 car lengths ahead of the caboose on account of the dust. Shortly before the derailment occurred Brakeman Carney came down from the cupola and after looking out the rear door told him that something was wrong, but as the brakes were then being applied from the head end no action was taken to stop the train from the caboose. Shortly after the occurrence of the accident he found a journal burned off of the tenth car; the stub of the remaining portion of the axle was worn cone-shaped but it was not red hot at the time. Conductor Howard further stated that the brakemen looked over the train when the brakes were being tested and he also said, that it was customary for crews of inbound trains to leave some notice or to note on waybills any defective condition such as a hot box, and there was no notation on the waybill for the car in question.

Trains from Spokane and other points on various branches of this division are operated to Ayer and set out at that point. One of these inbound trains is handled by a traveling switcher which consolidates the westbound cars from the various trains above mentioned into a train which leaves Ayer as train no. 251, this being the train involved in the accident. Ayer is the terminal for crews operating between Ayer and Rieth, near Pendleton, Oreg., and the crew here involved was making the return movement to Rieth. No car inspection or repair force is maintained at Ayer, but an engine watchman is required to care for any oiling or brassing that may be necessary; departing crews make their own air-brake tests.

Car Inspector Alexander stated that he was on duty at Rieth at the time U. P. 169089 arrived at that point empty on July 30 and left without lading on July 31, and his records showed no repairs made to this car. Car Foreman Lillie stated that Rieth is a class B inspection point and such an inspection does not include the inspection of oil boxes on empty cars, unless special instructions are issued to place these cars on the repair track or there is some indication that the journals have been running hot.

The first mark of disturbance was a piece of brass found on the end of a tie 5, 290 feet east of the frog of the spur track; 176 feet farther west another piece was found; 336 feet beyond this point was the first mark on top of a rail; the wedge was 56 feet farther west and

the end of the journal was found 843 feet beyond the wedge, 50 feet from the center line and on the south side of the track. The first indication of the wheel being derailed was 1,643 feet west of where the journal was found, or at a point 2,237.5 feet east of the spur-track frog. The journal which burned off the left no. 2 journal, and the marks indicated that the truck side dropped to the ties and was dragged along in that position, with the wheel derailed, until it encountered the frog at the spur-track switch.

U. P. Car 169085 was an all-steel box car with a loaded capacity of 100,000 pounds and at the time of the accident it was loaded with 93,000 pounds of sacked wheat. It showed a repack stencil dated of April 28; on August 13 it was picked up at Mockonema, Wash., 78 miles east of Ayer, and moved to Hooper Junction, 21.5 miles east of Ayer, where it was picked up by another train and set out at Ayer at 3:20 a.m., August 14, moving from the latter point in train no. 251 on the same date. It was equipped with Vulcan truck sides, with journals 5 1/2 x 10 inches.

### Conclusions

This accident was caused by a broken journal due to overheating.

The journal which failed was on the left side of the tenth car in the train. Fragments of brass, the wedge, and burning waste, were found at different points as far back as 1 mile from the switch where the final derailment occurred. An inspection made by a metallurgist subsequent to the accident indicated that the journal failed through a circumferential crack that developed in the bearing surface of the journal, due to internal structural defects; these defects consisted of a segregation of impurities in the steel, also some porosity near the surface due to the failure of the steel manufacturer to crop off a sufficient amount of the end of the ingot to eliminate all injurious defects. It developed during this inspection that there was only about 3 inches of solid metal holding just prior to the time of failure and the journal readily heated after wearing down into the defective area, and the fact that brass and babbitt metal were found at the base of the circumferential crack was considered as indicating that the journal had been exceedingly hot at numerous times prior to its failure.

According to the statements of the crew, there were no indications of a hot box at any time after leaving the initial terminal. When the train was stopped at two points en route, one of the brakemen stood on the left side and watched the entire train pass him after cars had been set out at Walker Pit, while other members of the crew looked over the train while it was in motion; the right side of the train was visible most of the time, but on the left side it was very much obscured by dust rising from the track and bluffs along the right of way.

Rieth is known as a Class B inspection point and cars do not receive inspection of journal boxes unless their outward appearance indicates that they have been heating. This car was later loaded at a non-inspection point and passed through Ayer, where no car inspectors are maintained. Taking into consideration the length of trains being handled, particularly during the time of year in which the accident occurred, and the peculiar physical characteristics in that locality, it is difficult to discover defective cars from either end of the train while in motion. Under such circumstances, provision should be made for adequate inspection at designated points en route. In this connection attention is called to the fact that since January 1, 1933, train no. 251 had been delayed on 13 occasions as a result of

hot boxes, and on July 11 the mechanical foreman at Wallula, 2.6 miles west of Attalia, sent a message to the master mechanic in which he said there had been five hot boxes into Wallula on train no. 251 during the past three days. Ayer is a junction and terminal and cars are assembled from branch lines for movement over the main line to destination; these facts indicate that this point should be made an inspection point, with qualified car men on duty.