

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE  
OREGON SHORT LINE RAILROAD AT ZENDA, IDAHO  
JULY 31, 1920.

August 18, 1920.

On July 31st, 1920, there was a derailment of a passenger train on the Oregon Short Line Railroad at Zenda, Idaho, which resulted in the injury of 25 passengers, 2 employees on duty and 3 mail clerks. After investigation of this accident the Chief of the Bureau of Safety submits the following report:

The accident occurred on that portion of the Utah Division extending from Pocatello, Idaho, to Salt Lake City, Utah. From Pocatello to McCammon, a distance of 22.7 miles, the line is double track and from McCammon to Salt Lake City, 147.5 miles, it is single track. At Zenda, the point of accident, 44 miles east of Pocatello, the line is single track and extends east and west. The movement of trains is governed by time-table, train orders and automatic block signals.

Beginning about one half mile west of the point of derailment and proceeding eastward, the track is tangent for 1,850 feet, followed by a curve to the right or south 700 feet long, having a maximum curvature of 3 degrees 6 minutes. The initial point of derailment is 525 feet east from the beginning of this curve. At this point the track is on a 6 foot fill. Approaching from the west there is a descending grade of approximately six tenths of one per cent for five miles, but at the point of accident the track is level. About 265 feet east from the initial point of derailment is located the west switch of the passing track on the south, and leading off from the west end of this track on the south is a short spur track for local delivery cars. On the west end of the spur track there were standing at the time of accident one wooden coal car loaded with coal and one empty box car.

The train involved in the accident was eastbound passenger train No. 32, running from Butte, Mont., to Salt Lake City, Utah. At the time of the accident it consisted of locomotives 3112 and 3102, 1 mail-express car, 2 baggage cars, 1 coach, 1 chair car, 1 dining car, 5 Pullman sleeping cars and 1 business car. The cars were of all-steel construction except the dining car which had a steel underframe, and the business car which was of wooden construction. This train was in charge of Enginemen Brennan, and Thompson, and Conductor Korner. It left Pocatello, its initial station for the Utah Division, at 4.58 a.m. 28 minutes late. At

McCammon both engines took full tanks of water, and the train departed at 5.33 a.m., 18 minutes late; it arrived at Downey, 16.2 miles east of McCammon, at 6.00 a.m. and departed at 6.01 a.m., twenty one minutes late. The train was derailed at a point 265 feet west of the west switch of the passing track at Zenda, 5.1 miles east of Downey, at 6.10 a.m. while running at a speed estimated to have been between 40 and 45 miles per hour. The weather was clear at the time of the accident.

Shortly after the initial derailment, the leading locomotive, 3112, broke away from the remainder of the train and it stopped in an upright position of the track with its pilot 1,475 feet east of the initial point of the derailment. The rear engine wheels and forward tender truck were derailed. The rear tender truck displaced the engine truck of engine 3102 and was lodged under the forward part of that engine. The second locomotive, 3102, was entirely derailed and came to rest with its pilot 680 feet west of engine 3112. This engine was turned partly over and its right side was buried in the roadbed. Neither engine was badly damaged. The mail-express car came to rest in an upright position with its rear end to the south and at right angles with the tender of engine 3102. In coming to this position, the center of the side of the car, struck the end of the coal car which was standing at the end of the spur track, crushing in the side of mail car. The first baggage car was west of and parallel with the mail car, while the second baggage car came to rest in an upright position with its forward end turned to the right and near the center of the second car. The coach was forced past the second baggage car and came to rest parallel with it, with its forward end near the rear of the mail-express car. The chair car, dining car, and first sleeping car were also derailed and partly turned over on their right sides. With the exception of the sleeping car, the trucks had been forced from under all of the above cars and were more or less demolished. The other cars of the train remained on the rails and were but slightly damaged.

Engineman Brennan of the leading engine made an inspection of the engine and tender before leaving Pocatello and again at McCammon on the morning of the accident, and was satisfied that there was nothing wrong with engine or tender. He tested the brakes at Pocatello, before leaving in this trip, and after leaving Pocatello and prior to the accident he had used the brakes several times, the brakes operating properly. Before reaching the curve at Zenda Engineman Brennan made a light application of the brakes and released them about the time engine struck the curve, the speed of the train being reduced from 47 or 48 miles per hour to 44 or 45 miles per hour by this application. As his engine was going around the curve near the west switch at Zenda, he looked back at his train and noticed fire flying from beneath the tender of engine 3112 and he immediately made an emergency application

of the brakes; when his engine reached the frog of the west switch he felt a severe lurch and upon looking back observed that rear tender trucks of his engine were gone and rear of tender down on the rails. He then let engine drift along until it stopped clear of the wreckage.

Engineman Thompson who was in charge of the second engine felt a slight application of the air brakes as train approached the curve a quarter or half mile west of the point of derailment, he saw gravel flying from under the tender of engine 3112 just before the air brakes were applied in emergency.

Road Foreman of Engines Meredith had made a special examination of the truck of the tender of engine 3112 a few days prior to the date of derailment and found no defects in the trucks at that time. Engine Inspector Lewis made a thorough inspection of engine 3112 and tender on July 31st, after the accident, and found no defects which could have had any bearing on the accident.

Section Foreman Witteridge had done no work on the track in the vicinity of the accident during the two weeks prior to accident; he inspected the track one half hour after the accident and found nothing wrong with it at point of derailment.

Engineer Maintenance of Way Prater also made an inspection of the track in the vicinity of the point of derailment on the morning of the accident, the track up to and at point of derailment was in good condition and in accordance with the standards of the Oregon Short Line Railroad. He stated that this track would carry trains with safety at a speed of 65 miles per hour.

At the point of derailment 80-lb. 33 foot steel rails are used, laid on Douglass fir ties, with tie plates, single spiked, double spiked on curves, with 18 ties to the rail. Rails are connected with continuous joints 27 inches in length and fastened with four 7/8 inch bolts staggered. Joints are staggered and suspended. The track is laid on gravel ballast 6 to 12 inches in depth and is well maintained. The elevation of the outer rail increases from zero at the point of curve to a maximum of 5½ inches at the center of curve, and falls to zero at the point of tangent. The gauge varies from 1/16 to 1/2 inch wide.

Inspection disclosed that the first mark of the derailment was at a joint on the north rail 265 feet west of the point of the west switch of the passing track. At this point the two nuts on the joint on the inside of the rail were sheered off and the heads of the two remaining

bolts scored. Beginning on the third tie east there were flange marks inside of the rail. On the south rail the first mark appeared to be the scoring on the heads of two spikes on the south side of the rail, on the third tie east of the first mark on the north rail. From this point the wheels followed along on the ties three or four inches from the rail until they reached the passing track switch. Beyond this point the track was so badly torn up it was impossible to tell what occurred.

Locomotives 3112 and 3102 are of the 4-6-2-type, having a total length of 44 feet 10 inches, and a total weight of 236,400 pounds; on drivers 150,000 pounds. The tenders of the two locomotives are of the Vanderbilt type, 28 feet in length, having a capacity of 7,000 gallons of water, and a total weight when loaded with coal and water of 137,740 pounds, and height of 12 feet 1- $\frac{1}{2}$  inches. They are equipped with Andrews trucks having a wheel base of 66 inches and a distance of 150 inches between centers of truck.

From the statements of Enginemen Brennan and Thompson and from subsequent inspection it is believed that the rear tender truck of engine 3112 was the first to leave the rail, following along on the ties until it reached the west switch of the passing track which caused the following cars to be derailed.

An examination of the rear truck of the tender of engine 3112 disclosed nothing which would cause or contribute to the accident. It was partly broken but its condition indicated that it was broken as a result of the derailment. The leading wheels of this truck were standard steel tire wheels. The rear pair were solid rolled steel wheels. Subsequent to the accident the wheels and flanges were gauged and found to be in a good condition. The leading truck of engine 3112 was practically undamaged.

Investigation disclosed that the tender of locomotive 3112 had been derailed at Cornish, Utah, on June 20th and that in March of this year a car in a moving freight train had been derailed at the point of accident under investigation. In the former instance the derailment was found to have been caused by excessive speed and in the latter to a broken arch bar, and therefore neither has any bearing on this accident.

The investigation of this accident disclosed no defect in track or equipment nor is there evidence of excessive speed. It is believed that the derailment was caused by the bunching of the engine and cars behind the tender of engine 3112, causing the rear truck of the tender of the leading engine to be lifted from the rail and it then dropped inside the rails on the curve. It is probable that had it not been for the west switch of the passing track,

which presented an obstruction to the derailed truck, but little damage would have resulted.

In this instance it appears that the two locomotives were used on the train for convenience in returning power to Salt Lake City and not as a matter of necessity. The practice of double-heading passenger trains unnecessarily is to be discouraged as it introduces an additional element of danger in train operation.

That there was no loss of life and but a few serious injuries is undoubtedly due to the fact that practically all cars in this train were of steel construction.

Enginemen Brennan entered the service of the Oregon Short Line Railroad as fireman in 1892 and was promoted to engineman in 1897. Engineman Thompson entered the service as fireman in 1899 and was promoted to engineman in 1904. Both enginemen have excellent records.

At the time of accident the train crew and the engine crew of the leading engine had been on duty 6 hours and the engine crew of the second engine 5 hours and 25 minutes in the aggregate in a twenty-four-hour period.