INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 3111

NORTHERN PACIFIC RAILWAY COMPANY

REPORT IN RE ACCIDENT

AT ORISKA, N. DAK., ON

JUNE 16, 1947

SUMMARY

Railroad:	Northern Pacific
Date:	June 16, 1947
Location:	Oriska, N. Dak.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	Extra 2680 East
Engine number:	2680
Consist:	109 cars, caboose
Speed:	38 m. p. h.
Operation:	Timetable, train orders and automatic block-signal system
Track:	Single; tangent; 0.375 percent descending grade eastward
Weather:	Clear
Time:	3:55 a. m.
Casualties:	2 killed; 11 injured
Cause:	Failure of a coupler yoke

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3111

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

NORTHERN PACIFIC RAILWAY COMPANY

July 29, 1947

Accident at Oriska, N. Dak., on June 16, 1947, caused by failure of a coupler yoke.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On June 16, 1947, there was a derailment of a freight train on the Northern Pacific Railway at Oriska, N. Dak., which resulted in the death of 2 trespassers, and the injury of 11 trespassers.

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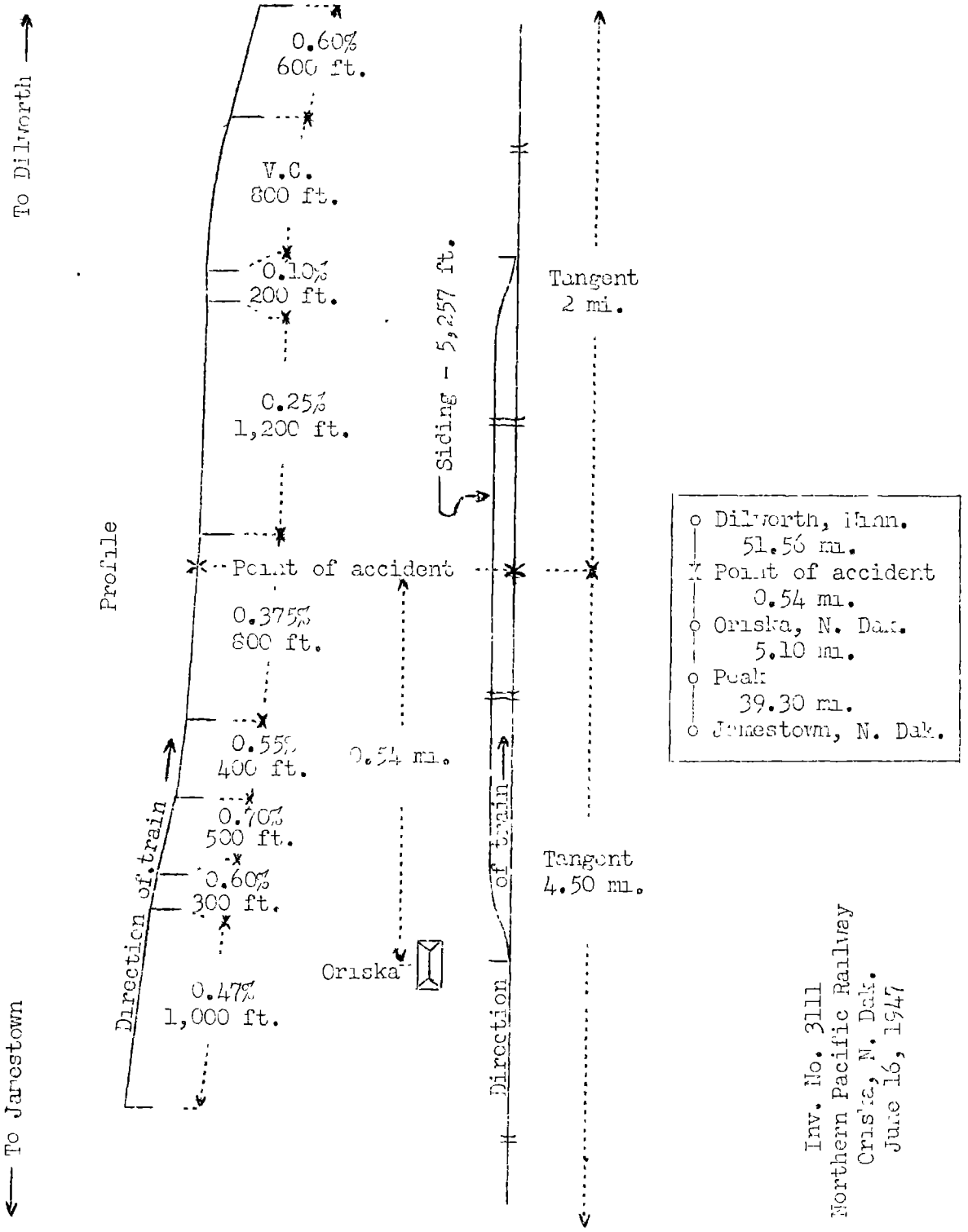
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 3111
Northern Pacific Railway
Oriska, N. Dak.
June 16, 1947

Location of Accident and Method of Operation

This accident occurred on that part of the Fargo Division extending between Jamestown, N. Dak., and Dilworth, Minn., 96.5 miles, a single-track line in the vicinity of the point of accident, over which trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred on the main track 44.94 miles east of Jamestown, at a point 0.54 mile east of the station and between the switches of the siding at Oriska. The main track is tangent throughout a distance of 4.50 miles immediately west of the point of accident and about 2 miles eastward. The grade for east-bound trains is undulating, varying between 0.78 and 1.07 percent descending throughout a distance of 2.40 miles, then there are, in succession, a vertical curve 400 feet, a variation of grade from 0.40 to 0.70 percent descending 700 feet, a vertical curve 400 feet, a variation of grade from 0.05 to 0.20 percent descending 0.53 mile, a vertical curve 800 feet, and a variation of grade from 0.375 to 0.70 percent descending 1.13 miles to the point of accident, where it is 0.375 percent. Immediately east of the point of accident the grade varies between 0.10 and 0.25 percent descending 1,400 feet, then there is a vertical curve 800 feet and a 0.60 percent descending grade 600 feet.

The track structure consists of 100-pound rail, 39 feet in length, laid during 1929, on an average of 23 ties to the rail length. It is fully tieplated, single-spiked, provided with 4-hole angle bars, and an average of 14 rail anchors per rail length. It is ballasted with gravel to a depth of 24 inches.

This carrier's Instructions for Operating and Maintaining Air Brake Apparatus read in part as follows:

Effect of Grade and Curvature:

16. * * * if the head portion is on a steeper descending grade than the rear portion, such changes in grade will tend to run out the slack. * * *

21. Again, if slack runs out from the rear end at a given rate of speed, the liability of damage is increased with the weight of the engine and with the presence of loads right back of it, as compared with empties. * * *

Releasing:

10-A. At how low speeds freight train brakes can be released without liability of damage depends (a) on the length of the train; (b) on how heavily the brakes are applied; (c) on whether the slack is then in or out, lightly or heavily; (d) on whether track conditions (sags, humps, and curves) do or do not favor releasing; * * * enginemen must, therefore, exercise judgment in this, but take all chances on the side of stopping.

The maximum authorized speed for freight trains is 50 miles per hour.

Description of Accident

Extra 2680 East, an east-bound freight train, consisting of engine 2680, 109 cars and a caboose, departed from Jamestown at 2.05 a. m., passed Peak, the last open office, 5.1 miles west of Oriska, at 3:49 a. m., and while it was moving on the main track at a speed of 38 miles per hour the rear coupler of the thirty-ninth car was pulled out and dropped to the track, and the fortieth to sixty-first cars, inclusive, were derailed at a point 0.54 mile east of the station at Oriska.

The front portion of the train stopped with the rear of the thirty-ninth car standing 2,382 feet east of the point of derailment. The fortieth to sixty-first cars, inclusive, stopped in various positions, with the most easterly car and the most westerly car, respectively, 566 feet and 53 feet east of the point of derailment. The derailed equipment was badly damaged. The casualties occurred on the forty-seventh car, which was a flat car loaded with two trucks.

The weather was clear at the time of the accident, which occurred about 3:55 a. m.

The thirty-ninth car of Extra 2680 East M.P.C.X. 712, a tank car built in 1920, and owned by the Magnolia Petroleum Company, Dallas, Tex., is of steel construction, except the side and the end running boards. Its lightweight, capacity and load limit are, respectively, 46,100, 100,000, and 161,000 pounds. Its capacity is 10,137 gallons. At the time of the accident the car was empty. It was equipped at the A, or west, end with an E-type, top-operated, cast-steel coupler having an 11-inch knuckle, a 5-inch by 7-inch shank and a 5-inch by

9-1/8-inch butt. The coupler was provided with a vertical-type yoke secured to the coupler butt by two rivets 1-1/4 inches in diameter and applied vertically through the butt. The yoke, which contained the friction-casings, spring rod and filler block, was a wrought-steel bar 5 inches wide, 1-1/4 inches thick and bent into U-shape. The legs were 27 inches long, spaced 9-1/8 inches apart, and were shaped at the front ends into overlapping gibs 3/4-inch long, which were clamped over right-angled edges of the coupler butt. A filler-block, 1-inch thick, 5 inches wide and 8-5/8 inches long, was riveted vertically inside the rear bend of the yoke by one 7/8-inch rivet. The brake system of this car was provided with a K-2 triple valve, and the air-brake system was last cleaned at Chaison, Tex., on August 19, 1946. The journal boxes were last repacked at Pittsburg, Kans., on November 9, 1946.

Engine 2680 is provided with No. 8-ET brake equipment. The brake-pipe feed valve, an H3 type, was adjusted to supply 70 pounds brake-pipe pressure, and the high-pressure head of the compressor governor was adjusted to supply main-reservoir pressure of 140 pounds.

Discussion

Extra 2680 East was moving at a speed of 38 miles per hour, as indicated by the speedometer with which the engine was equipped, in territory where the maximum authorized speed for this train was 50 miles per hour, when the fortieth to sixty-first cars, inclusive, became derailed at a point 0.54 mile east of the station at Oriska. The first the members of the crew knew of anything being wrong was when the derailment occurred.

After the accident examination disclosed that the rear coupler of the thirty-ninth car of Extra 2680 East, M.P.C.X. 712, an empty tank car, had been pulled out and dropped to the center of the track and had broken a tie at a point 19 feet west of the point of derailment. When the coupler dropped, the end-sill of the car, the carry-iron, the striking-plate and portions of the yoke remained attached to the coupler. The front truck of the fortieth car struck some portion of this assembly and dragged the coupler about 19 feet to the point where the derailment occurred. The coupler yoke was broken into four pieces, two of which remained attached to the coupler butt. One break was at the location of the rear butt rivet, and the other breaks occurred at the upper and the lower bends at the rear of the yoke. These breaks were square

and extended throughout the thickness and the width of the yoke. There was an incipient progressive detail fracture crosswise of the throat of the lower bend at the rear of the yoke. This fracture was 3-3/8 inches in length and extended inward 3/16 inch at its greatest depth, which was near the center of the yoke, then it extended diagonally upward on each side to the inner surface of the yoke. This fracture covered about 5.2 percent of the cross-sectional area. The remainder of the break at this point and at the other points of fracture were new and the metal was sound.

The superintendent of the car department said that apparently all the breaks in the yoke occurred simultaneously as a result of a severe stretching of the slack of the train, as there was no mark on the rear filler block to indicate a succession of breaks. If one of the bends at the rear of the yoke had broken prior to the break at the other bend, the filler block would have been severely scraped by its dragging against the rear follower. In the opinion of the superintendent of the car department, the progressive detail fracture at the lower bend had not progressed sufficiently for complete failure to occur at this point during normal use.

The investigation disclosed that M.P.C.X. 712 arrived at Jamestown at 1:05 a. m., on June 16, 1947, and was inspected by the mechanical forces soon afterward. During this inspection no defective condition of this car was found. This car was not handled in any switching movement during the time it was at Jamestown, and it departed in the train of Extra 2680 East at 2:05 a. m.

As Extra 2680 East was approaching Oriska on the descending grade the speed was 50 miles per hour. The enginemen and the front brakeman were on the engine, and the conductor, the middle brakeman and the flagman were in the caboose. Brake-pipe pressure of 70 pounds was being maintained. In order to control the speed of his train on the descending grade, the engineer made a 6-pound brake-pipe reduction when the train was about 2 miles west of Oriska, then moved the brake valve to lap position. After an interval of about 50 seconds, he made another brake-pipe reduction of about 9 pounds. This brake application of about 15 pounds remained applied throughout a distance of about 1 mile until the speed was reduced to about 40 miles per hour, then the engineer initiated a release of the brakes by moving the brake valve to running position at a point about 1/2 mile west of the station at Oriska. About 1-1/2 minutes later the engineer observed that the speed was about 38 miles per hour and that the air gage indicated the brakes were being applied. At that time he

thought the conductor had opened the conductor's valve on the caboose. The flagman was in the cupola of the caboose and was observing the brake-pipe air gauge during the braking period. He said that the brake-pipe reduction totalled 20 pounds, and no indication of a release of the brakes was felt at the rear of the train. The brake-pipe pressure remained at 50 pounds during a considerable period, then dropped to zero, and the rear portion of the train stopped abruptly. The members of the crew said that prior to the derailment there was no unusual slack action or rough handling, and the train had been operated smoothly throughout the trip. The brakes of this train had been tested at Jamestown, and they functioned properly during the test. After departure of the train from Jamestown, the brakes were not used throughout a distance of about 42 miles, until the brakes were applied about 2 miles west of Oriska.

The evidence indicates that the coupler yoke at the rear of the thirty-ninth car was broken as a result of severe stretching of the slack between the cars, of sufficient force to break the coupler yoke at three locations and to tear loose the metal end-sill of the car. The cars of Extra 2680 East were arranged in the train from the front to the rear end as follows: 16 loaded cars, 1 empty car, 10 loaded cars, 2 empty cars, 3 loaded cars, 1 empty car, 5 loaded cars, 1 empty car, 43 loaded cars, 27 empty railway-service cars and the caboose. This train was about 5,000 feet long. At the time of the accident the engine had entered upon a 0.60 percent descending grade, the thirty-ninth car was on a 0.375 percent descending grade and the rear 71 units were on a gradient varying between 0.375 and 0.70 percent descending. The service cars and the caboose were moving on a portion of the grade which is 0.47 percent descending. The evidence indicated that at the time of the accident, the brakes at the rear of the train had not released. The general mechanical superintendent said that an interval of not less than 2 minutes would be required to effect the release of all brakes of the train involved. A release had been initiated about 1-1/2 minutes prior to the accident, consequently, most of the brakes of the forward portion of the train had released. Since the rear 28 units were empty, their braking ratio was considerably higher than that of most of the cars in the front portion of 82 cars. This resulted in a higher degree of retardation existing at the rear of the train than at the front end. The front portion of the train was running freely, then, when the engine entered upon the 0.60 percent gradient, sufficient

force was exerted to break the coupler yoke. This carrier has issued no definite instructions pertaining to the releasing of the brakes of a freight train in motion, particularly with respect to the length of the train, the consist, and the profile and alinement of the track.

Cause

It is found that this accident was caused by the failure of a coupler yoke.

Dated at Washington, D. C., this twenty-ninth day of July, 1947.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.