INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2875

GREAT NORTHERN RAILWAY COMPANY

REPORT IN RE ACCIDENT

NEAR TONGA, WASH., ON

MARCH 7, 1945

SUMMARY

Railroad:	Great Northern
Date:	March 7, 1945
Location:	Tonga, Wash.
Kind of accident:	Derailment
Train involved:	Mail-express-baggage
Train number:	Third 1
Engine number:	5011
Consist:	12 cars
Estimated speed:	In excess of 60 m. p. h.
Operation:	Timetable, train orders and automatic block-signal system
Track:	Single; 10° curve; 2.2 percent descending grade westward
Weather:	Clear
Time:	5:47 a. m.
Casualties:	1 killed; 9 injured
Cause:	Excessive speed on sharp curve

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2875

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

GREAT NORTHERN RAILWAY COMPANY

April 23, 1945.

Accident near Tonga, Wash., on March 7, 1945, caused by excessive speed on a sharp curve.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On March 7, 1945, there was a derailment of a mail-express-baggage train on the Great Northern Railway near Tonga, Wash., which resulted in the death of one train-service employee, and the injury of seven railway-mail clerks and two train-service employees.

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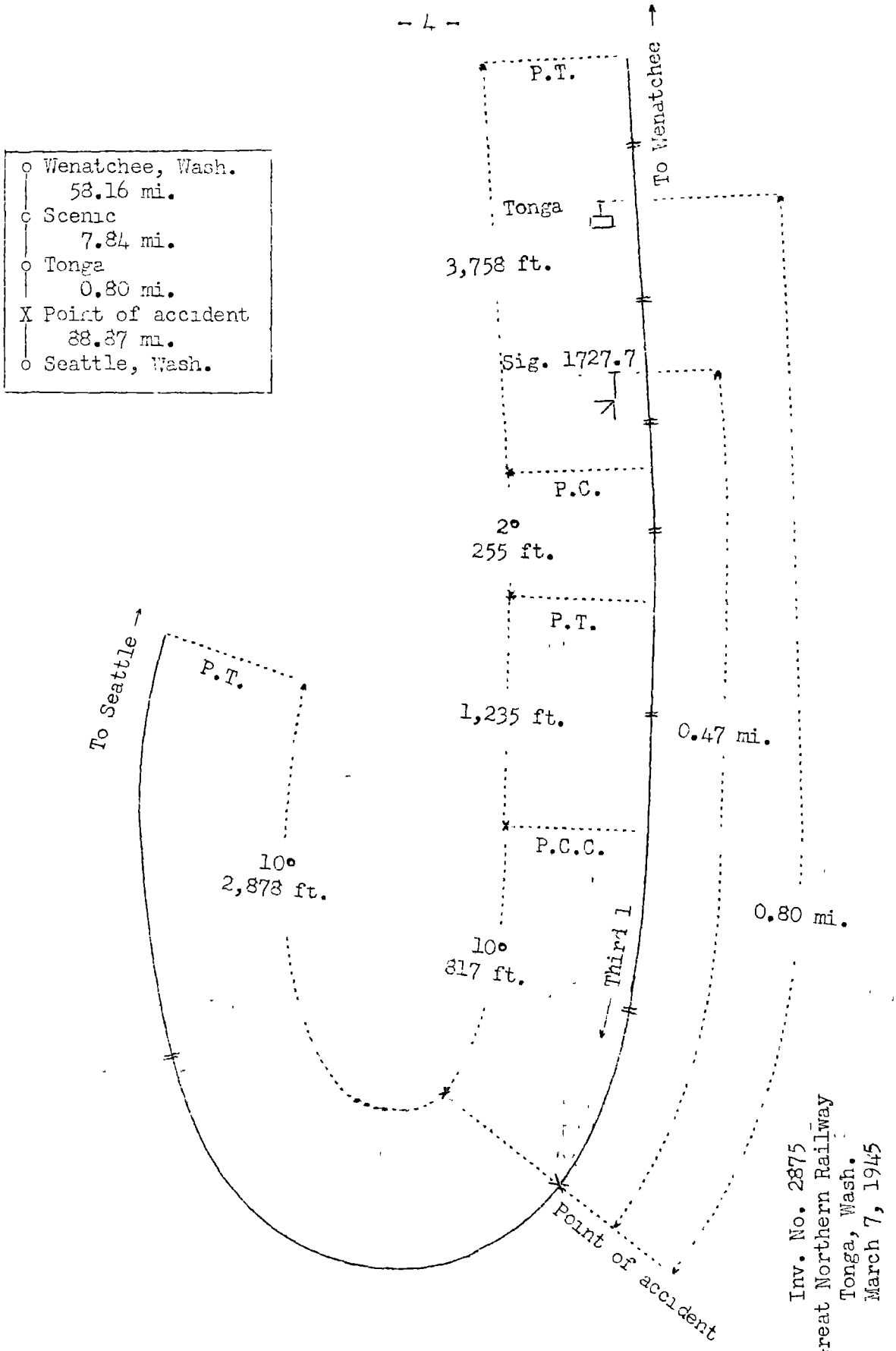
[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 2875
Great Northern Railway
Tonga, Wash.
March 7, 1945

Location of Accident and Method of Operation

This accident occurred on that part of the Spokane Division designated as the Second Subdivision and extending westward from Wenatchee to Seattle, Wash., 155.67 miles. In the vicinity of the point of accident this was a single-track line equipped with an overhead catenary system for the electric propulsion of trains. Trains were operated by timetable, train orders and an automatic block-signal system. The accident occurred on the main track 66.8 miles west of Wenatchee, at a point 0.8 mile west of the station at Tonga. From the east there were, in succession, a tangent 3,758 feet in length, a 2° curve to the right 255 feet, a tangent 1,235 feet and a compound curve to the right, the maximum curvature of which was 10°, extending 817 feet to the point of accident and 2,878 feet westward. The grade for west-bound trains varied between 1.5652 and 1.7 percent descending throughout a distance of 9.1 miles, then it was 2.2 percent descending 7.65 miles to the point of accident and 2.7 miles westward.

On the curve on which the derailment occurred the track was laid on a fill, the maximum height of which was 47 feet. The track structure consisted of 130-pound rail of varying lengths, relaid on the low side of the curve in 1942, and on the high side in 1943, on 23 treated ties to a panel 39 feet long. It was fully tieplated, double-spiked, provided with 24-inch angle bars and an average of 8 rail anchors per rail length, and was ballasted with crushed rock to a depth of 10 inches. The maximum superelevation was 3-1/2 inches and the gage varied between 4 feet 8-1/2 inches and 4 feet 8-3/4 inches. At the point of derailment the superelevation was 3 inches and the gage was 4 feet 8-1/2 inches.

Automatic signal 1727.7, governing west-bound movements, was 0.47 mile east of the point of accident.

Between points, respectively, 2 miles east and 2.41 miles west of the point of derailment the maximum authorized speed for passenger trains was 30 miles per hour.

Description of Accident

Third 1, a west-bound first-class mail-express-baggage train, consisted of electric engine 5011, of the 2-6-6-2 articulated type, one heating car, four baggage cars, one express-refrigerator car, two baggage cars, one mail car, two baggage cars and one coach, in the order named. The fifth to seventh cars, inclusive, and the eleventh car were of steel-underframe construction, and the remainder were of all-steel construction. This train departed from Wenatchee at 3:50 a. m., 1 hour 35 minutes late, passed Scenic, 7.84 miles east of Tonga and the last open office, at 5:32 a. m., 54 minutes late, passed Tonga, passed signal 1727.7, which displayed proceed, and while

it was moving at a speed in excess of 60 miles per hour the engine and the first eight cars were derailed.

The engine and the derailed cars stopped, badly damaged and in various positions, with the front end of the engine 121 feet south of the track and 376 feet west of the point of derailment. The rear four cars remained coupled and stopped with the first of these 939 feet west of the point of accident.

The weather was clear at the time of the accident, which occurred at 5:47 a. m.

The fireman was killed, and the engineer and the front brakeman were injured.

The total weight of engine 5011 was 518,250 pounds, distributed as follows: A-engine truck, 53,835 pounds; A-driving wheels, 205,290 pounds; B-driving wheels, 205,290 pounds; and B-engine truck 53,835 pounds. The diameters of the engine-truck wheels and the driving wheels were, respectively, 36 inches and 55 inches. The rigid wheel base of each driving-wheel assembly was 15 feet 4 inches, and the total length of the engine was 73 feet 9 inches. The center of gravity was 72 inches above the tops of the rails. The engine was provided with speedometers, No. 14-EL air-brake equipment, and equipment for regeneration of electric power on descending grades. The regeneration feature of this engine was arranged so that, for the weight of the train, it would automatically cut out when the speed was in excess of 35 miles per hour.

Discussion

Third 1 was moving on a 10-degree curve to the right when the engine and the first eight cars were derailed. The engine overturned to the left without marking the outside rail or the area between the rails, and slid on its left side 376 feet beyond the point of derailment.

There was no defective condition of the engine prior to the accident. There was no indication of dragging equipment, defective track, or of any obstruction having been on the track. There was no condition found that would prevent the proper application of the train brakes. The maximum authorized speed on the curve was 30 miles per hour. On the descending grade throughout a distance of about 16 miles immediately east of the point of accident the regeneration feature was operating, and the speed of the train was controlled by the braking effect which resulted from the operation of this feature.

The engineer said that soon after his train passed through Cascade Tunnel, which was 7.79 miles in length, and the east portal of which was 16.75 miles east of the point of derailment, he took medicine to relieve a headache resulting from fumes in the tunnel. Because the train was late on its schedule, the engineer was anxious to make up time and he increased the speed

wherever he thought it safe to do so. As the train was approaching Tonga the engineer and the front brakeman were maintaining a lookout ahead from the front control compartment, and the fireman was engaged in duties in the rear of the engine. When the engine entered tangent track 1.17 miles east of the point where the accident occurred, the engineer moved the lever in control of the regeneration feature into position to reduce regeneration. Soon afterward he observed that the speedometer indicated a speed of 40 miles per hour, and he attempted to decrease the speed by moving the control lever to full regeneration position, then he lost consciousness until several minutes after the accident had occurred. He thought possibly he lost consciousness as a result of the effect of the medicine. The other surviving members of the crew did not detect any unusual fumes in the tunnel, and they were not aware of anything being wrong until the accident occurred. First 1 and Second 1 passed through the tunnel, respectively, 42 minutes and 26 minutes prior to the time Third 1 passed through it. No unusual condition in the tunnel was observed by the members of the crews of First 1 and Second 1.

The surface, alinement and gage of the track on the curve were well maintained for the maximum authorized speed of 30 miles per hour. The mechanical engineer said that the overturning speed at the point of derailment for engine 5011 was 60 miles per hour. The superintendent of electrification said that the recording charts on which the electric operation of Third 1 was shown indicated that throughout the first 8 miles of the 9 miles immediately east of the point of derailment the average speed was 33 miles per hour, and that throughout the last mile and an interval of 75 seconds the regeneration feature was not being used. He said that, based on a rate of acceleration of 0.69 mile per hour per second on the 2.2 percent descending grade, the speed of Third 1 increased from 33 miles per hour to 62 miles per hour during the last 75 seconds. From the manner in which the engine became derailed it is apparent that the train was moving at overturning speed.

Cause

It is found that this accident was caused by excessive speed on a sharp curve.

Dated at Washington, D. C., this twenty-third day of April, 1945.

By the Commission, Commissioner Patterson.

W. P. BARTEL,
Secretary.

(SEAL)