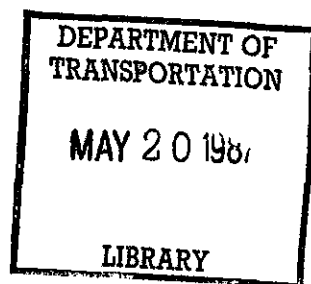


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Railroad Accident Investigation Reports

REPORT No. 79-1

BURLINGTON NORTHERN INC.
MADRAS, OREGON
JANUARY 15, 1978



U.S. Department of Transportation
Federal Railroad Administration
Office of Safety

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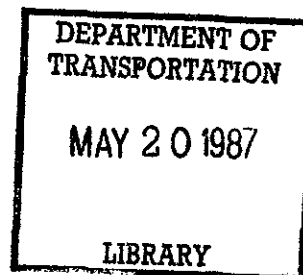
RAILROAD ACCIDENT INVESTIGATION

REPORT NO. 79-1, 79-2, 79-3.

BURLINGTON NORTHERN, INC.

MADRAS, OREGON

JANUARY 15, 1978



FEDERAL RAILROAD ADMINISTRATION.

OFFICE OF SAFETY,

WASHINGTON, D. C. 20590

FEDERAL RAILROAD ADMINISTRATION

OFFICE OF SAFETY

RAILROAD ACCIDENT INVESTIGATION

ACCIDENT REPORT NO. 79-1

BURLINGTON NORTHERN, INC.

MADRAS, OREGON

JANUARY 15, 1978

Synopsis

On January 15, 1978, at approximately 6:25 p.m., a rear end collision occurred between two Burlington Northern freight trains within yard limits at Madras, Oregon. Weather conditions at the time of the accident were dark and overcast.

Casualties

The front brakeman of the following train sustained fatal injuries to the chest and abdomen. The engineer of that same train suffered contusions and abrasions. He was treated at a local hospital and later released.

Cause

The collision was caused by the failure of the engineer to control the speed of the following train within yard limits.

Location and Method of Operation

The accident occurred on that part of the railroad extending from Wishram, Washington to Bend, Oregon, a distance of 151.5 miles. This is a single-track line over which trains operate by timetable, train orders and signal indications of an automatic block system. The collision occurred on the main track within yard limits at Madras, Oregon, 4,745 feet east of the station. Madras is 105.2 miles west of Wishram, Washington.

From the east on the main track there are, successively, a tangent 627.9 feet, a 2°30' curve to the left, 3,103.7 feet to point of collision and 1,007.6 feet beyond. In the accident area the grade is level.

Authorized Speed

Maximum authorized speed in the accident area is 35 m.p.h. Trains operating within yard limits must move prepared to stop within one-half the range of vision but not exceeding 20 m.p.h., unless the main track is known to be clear by block signal indication.

Signal

Signal 101.4, governing westbound movements on the main track, is located 2.39 miles east of the point of collision. The signal is a search-light type and is continuously lighted. Its applicable aspect, name and corresponding indication is:

<u>Signal</u>	<u>Aspect</u>	<u>Name</u>	<u>Indication</u>
101.4	Red with permissive marker	Permissive	Proceed at restricted speed through entire block

The signal is automatically actuated by track occupancy or by certain conditions affecting the use of the block. The circuits are so arranged that when a train occupies the track between signal 101.4 and the next controlling signal in advance, signal 101.4 displays a red-with-permissive-marker aspect for westbound trains.

Applicable Rules

Rule 93 - Yard limits will be indicated by yard limit signs. Stations where yard limits are in effect will be designated by timetable, train order, bulletin, general order or special instructions.

All trains and engines, except first class trains, must move within yard limits prepared to stop within one-half the range of vision but not exceeding 20 m.p.h., unless main track is known to be clear by block signal indication. ... (Burlington Northern Inc., Special Instruction No. 2)

Rule 804 (B) - When conditions or signals require that the train be stopped or speed of train be reduced and the engineer or conductor fails to take proper action to do so, or should the engineer become incapacitated, other members of the crew must take immediate action to stop the train, using emergency brake valve if necessary.

Restricted speed: Proceed prepared to stop short of train, engine or obstruction, or switch not properly lined, looking out for broken rail or anything that may require the speed of a train or engine to be reduced, but not exceeding 20 m.p.h. (Consolidated Code of Operating Rules)

Sight Distance

Track curvature and a hillside cut restricted the range of vision to 990 feet between the standing caboose and the control cab at the front end of the approaching road switcher-type locomotive. The locomotive engineer at the controls of the locomotive first observed the passive marking devices mounted on the rear of the caboose when illuminated by the locomotive headlight upon emerging from the cut approximately 700 feet from point of collision.

Circumstances Prior to the Accident

Extra 2526 West

Westbound freight train, Extra 2526 West, consisting of two diesel-electric locomotive units, 74 cars and a caboose, departed from Wishram, Washington at 5:35 p.m. on January 14, 1978. Because of delays enroute, the train was unable to reach its next terminal, Bend, Oregon, within the 12-hour limitation prescribed by the Hours of Service Act. A relief crew was dispatched from Bend, Oregon to complete the trip, but this crew also experienced operational delays. The train arrived at Madras, Oregon, 105.2 miles west of Wishram, at 3:08 p.m. on January 15, 1978. The train continued westward until the caboose stopped adjacent to the Madras station where the conductor and flagman detrained. The train then made a reverse movement on the

main track and stopped with the front end approximately 50 feet east of the Madras station. The entire train was within yard limits. The caboose was 4,745 feet east of the station, and 3,157.7 feet west of the yard limit sign.

A second relief crew was called in Bend at 4:30 p.m. and transported to Madras via carrier automobile. The crew arrived at approximately 6:00 p.m. and received its orders and clearances about 6:15 p.m. At 6:25 p.m. the crew had separated the locomotive consist from the train and was performing station switching.

The engineer was in the cab of the lead locomotive unit and the conductor and the two brakemen were in the vicinity of the west end of the train consist.

Extra 2211 West

Westbound freight train, Extra 2211 West, consisted of five road switcher type diesel-electric units (BN 2211, EMD-GP-30; BN 2545, EMD-GP-35; BN 2543, EMD-GP-35; BN 4188, ALCO RS-11; BN 4180, ALCO RS-11) 50 cars and a caboose (3836 tons). This train departed Wishram, Washington at 11:00 a.m. on January 15, 1978, without having performed the initial terminal road train air brake test as prescribed by 49 CFR 232.12. Enroute to Bend, 14 cars were added to the train's consist at Kashela, 80.4 miles west of Wishram. An intermediate terminal train air brake test as required was made by the train crew and no exceptions were taken. The train departed at 5:05 p.m.

Approaching signal 101.4, 2.4 miles east of the point of the collision, the train was operating at 20 m.p.h. on a 1.5% ascending grade. Signal 101.4 displayed red-with-permissive-marker aspect which allowed the train to pass without stopping and continue at restricted speed. The train proceeded past the signal at approximately 20 m.p.h. until it reached the grade summit, about 1.3 miles west. At this point, the grade becomes level and the train's speed steadily increased. As the train passed the yard limit sign about 2,500 feet further west, its speed continued to increase. When the train entered the curve, on which Extra 2526 West was standing, its speed had reached 31 m.p.h.

The engineer and front brakeman were in the cab at the front of the leading locomotive unit. The conductor and flagman were in the caboose at the rear of the train.

The Accident

Extra 2526 West

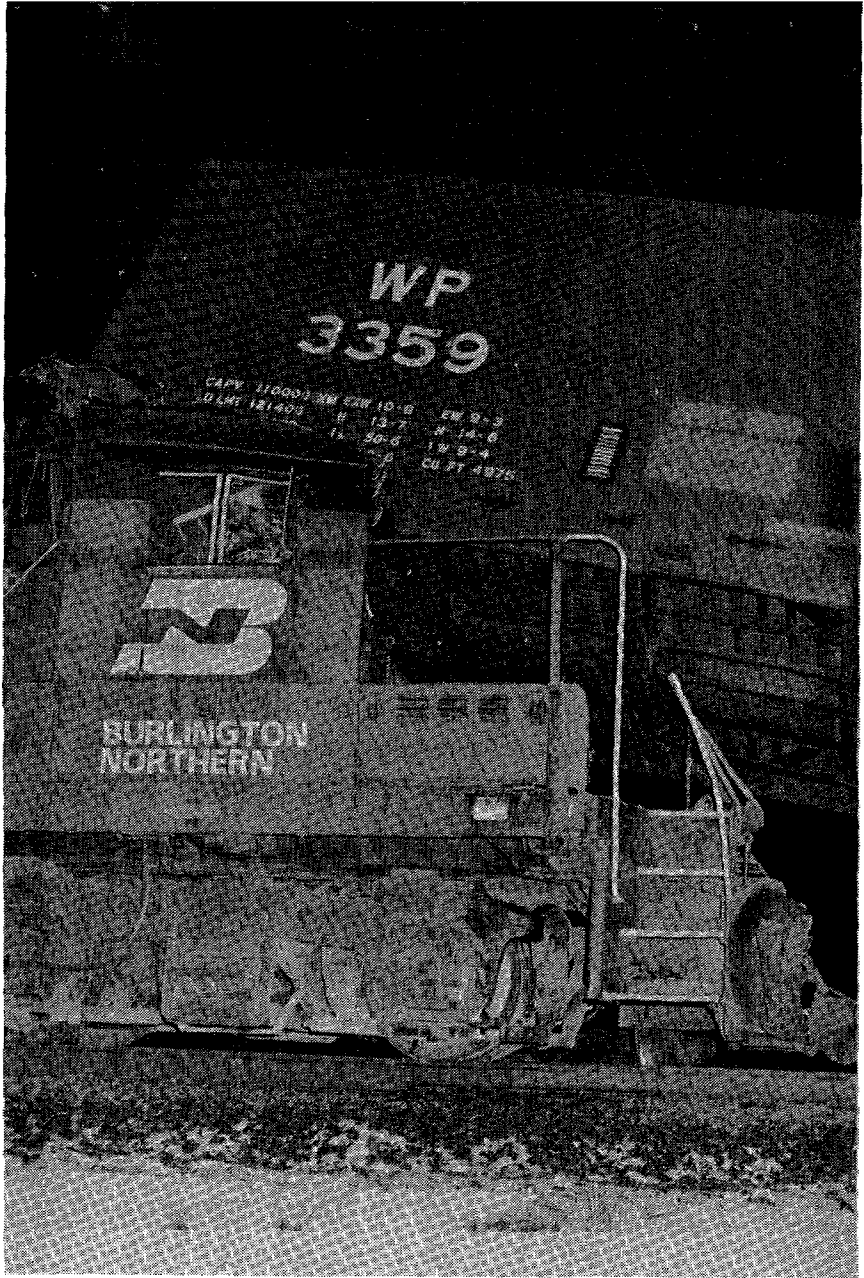
The relief crew of Extra 2526 West stated that there had been no movement of the train since their arrival at Madras, Oregon. Crew members further stated that they had just become aware of the accident after a radio conversation was overheard, indicating that a rear end collision had occurred.

Extra 2211 West

According to the engineer of Extra 2211 West, he had been operating the train on the ascending grade at a steady rate of speed in the throttle "eight" position. As the train reached the top of the grade, the train's speed began to increase. The engineer stated that he had changed the throttle position from "eight" to position "five" in an attempt to slow the train. The engineer said that he had observed the yard limit sign and was conversing with the front brakeman as the train entered the curve. He first observed the rear end of Extra 2526 West after emerging from the cut approximately 700 feet short of the caboose. He immediately made an emergency application of the train brakes and warned the front brakeman of the impending collision. Moments later, Extra 2211 West struck the caboose of Extra 2526 West. The caboose overturned on its side to the south alongside the main track. The east end of the next car, boxcar WP 3359, overrode the front of the locomotive unit BN 2211, shearing off the short hood and the control cab, as shown in the photograph. The boxcar stopped in an upright position, leaning to the south with the east end supported by the control cab of the locomotive unit.

Damages

The caboose and rear end of the preceding train were derailed. Those cars and the car ahead were substantially damaged. The first locomotive unit of the following train was substantially damaged, but did not derail. The carrier estimated the cost of damages to train equipment at \$102,000.



Locomotive Unit BN 2211 and Boxcar WP 3359

Crew of Extra 2211 West

This crew had been on duty 8 hours and 25 minutes at the time of accident, after having been off duty for over 12 hours.

The engineer was first employed as a fireman in July 1944. He was promoted to engineer in August 1953. He had received instruction and testing on operating rules in 1977 and operational efficiency tests which included restrictive block signal indications and speed restrictions in March, June and August of 1977. His record was clear.

The front brakeman was promoted from clerk to brakeman in November 1972. He had been examined on the operating rules in 1977.

Post-Accident Investigation

The controlling unit of the locomotive consist of Extra 2211 West, BN 2211, was equipped with 26L locomotive brake equipment. An examination of the cab of this unit disclosed that the automatic brake valve had been placed in emergency position. The independent brake valve was in release position, and the throttle was in idle. The safety control foot pedal, designed to initiate a penalty brake application if not depressed under locomotive operation, was found to be wedged with a foreign object to prevent this function. The remaining controls and valves of this unit and the four trailing units in the locomotive consist were found in the proper positions for the operation of a locomotive in multiple unit control. Unit 2211 was equipped with a speed recorder, however, the recording tape had expired prior to the point of collision. The speed indicator on this unit was operative.

Speed tapes were available from the second, fourth and fifth units in the locomotive consist. The speed recorders were calibrated before a comparison of the tapes were initiated. An examination of the tapes revealed that Extra 2211 West had been operating at 20 m.p.h. to a point approximately one mile east of the point of collision. From this point onward, the speed began to steadily accelerate until reaching a peak of 31 m.p.h. Reflecting the emergency application of the air brakes prior to collision, the speed tapes show a rapid decrease from 31 m.p.h. to 19 m.p.h. At 19 m.p.h., the graphs denote a collision by abruptly dropping to zero.

The caboose of train Extra 2526 West was equipped with two side mounted reflectorized marking devices. Each marking device was approximately 8 by 12 inches in size. There were no electric marking devices.

The previously mentioned lack of an initial terminal road train air brake test of Extra 2211 West was not a significant factor in the accident, due to the train brakes functioning properly when used enroute.

The FRA has taken appropriate action with respect to this matter.

Findings

1. At the time of the accident, Extra 2526 West was standing on the main track in the block of signal 101.4, in accordance with applicable rules and regulations of the carrier.
2. Because of its block being occupied, signal 101.4 displayed a Red-with-Permissive-Marker aspect for Extra 2211 West. This aspect authorized Extra 2211 West to proceed in the block of signal 101.4 at a speed not exceeding 20 m.p.h., prepared to stop short of a train or obstruction ahead.
3. Extra 2211 West approached the point of collision, where the view ahead was obstructed by embankments, at excessive speed for operating conditions.
4. Because of excessive speed, Extra 2211 West was unable to stop short of the train ahead.
5. The accident was caused by the failure of the engineer to control the speed of the following train within yard limits.
6. Failure of the front brakeman to recognize that the train was not being properly controlled and take such action for the safety of the train when the engineer neglected to do so was a causal factor in the accident.

Dated at Washington, D. C., this 23rd
day of April 1979
By the Federal Railroad Administration

J. W. Walsh
Chairman
Railroad Safety Board