Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-23

Burlington Northern Santa Fe (BNSF)
Douglas, Wyoming
April 26, 2007

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2007-23

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: PR04200711
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident No.: N/A
3.Name of Railroad Operating Train #3: N/A	3a. Alphabetic Code: N/A	3b. Railroad Accident/Incident No.: N/A
4.Name of Railroad Responsible for Track Maintenance: BNSF Rwy Co. [BNSF]	4a. Alphabetic Code: BNSF	4b. Railroad Accident/Incident No.: PR04200711
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 04 Day 25 Year 2007	7. Time of Accident/Incident: 01:26: ☐ AM ☑ PM

8. Type of Accident/Indicent (single entry in code box): 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other (describe in narrative) — Code: 01

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
0	N/A	N/A	0	Powder River

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Douglas	123.5	N/A	WY	CONVERSE

18. Temperature (F) (specify if minus)	19. Visibility (single entry) 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
65 F	2	1	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density (gross tons in millions)	25. Time Table Direction 1. North 2. South 3. East 4. — Code
Single Main Track	3	439	3

OPERATING TRAIN #1

26. Type of Equipment Consist (single entry) 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip. — Code	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
1	1	CJRMCRD055

29. Speed (recorded speed, if available) R - Recorded E - Estimated — Code	31. Method(s) of Operation (enter code(s) that apply)	31a. Remotely Controlled Locomotive?
45 MPH R	a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other (Specify in narrative)	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter: 0

30. Trailing Tons (gross tonnage, excluding power units): 18277

Code(s): e | N/A | N/A | N/A | N/A

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	FURX960622	93	yes
(2) Causing (if mechanical cause reported)	0	0	N/A

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
0	0

34. Was this consist transporting passengers? (Y/N): N

35. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	2	0	0	0	2
(2) Total Derailed	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	128	0	0	0	0
(2) Total Derailed	23	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
1090197.	125000.	T109	T206

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	0

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 5 Mi 46	Hrs 5 Mi 46

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	0

50. EOT Device? 1. Yes 2. No — 1

51. Was EOT Device Properly Armed? 1. Yes 2. No — 1

52. Caboose Occupied by Crew? 1. Yes 2. No — 2

OPERATING TRAIN #2

53. Type of Equipment Consist (single entry) 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip. — Code	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

56. Speed (recorded speed, if available) R - Recorded E - Estimated — Code	58. Method(s) of Operation (enter code(s) that apply)	58a. Remotely Controlled Locomotive?
0 MPH N/A	a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track	0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons (gross tonnage, excluding power units): 0

c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; o. Positive train control; p. Other (Specify in narrative)
Code(s): N/A | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	0	0	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A

60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

61. Was this consist transporting passengers? (Y/N): N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote	63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: 0

65. Track, Signal, Way, & Structure Damage: 0

66. Primary Cause Code: N/A

67. Contributing Cause Code: N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
0	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 0 Mi 0

73. Conductor: Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

77. EOT Device? 1. Yes 2. No: N/A

78. Was EOT Device Properly Armed? 1. Yes 2. No: N/A

79. Caboose Occupied by Crew? 1. Yes 2. No: N/A

OPERATING TRAIN #3

80. Type of Equipment Consist (single entry)
1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/switching; 8. Light loco(s); 9. Maint./inspect.car; A. Spec. MoW Equip.
Code: N/A

81. Was Equipment Attended? 1. Yes 2. No
Code: N/A

82. Train Number/Symbol: N/A

83. Speed (recorded speed, if available)
R - Recorded
E - Estimated
N/A MPH
Code: 0

84. Trailing Tons (gross tonnage, excluding power units): 0

85. Method(s) of Operation (enter code(s) that apply)
a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other (Specify in narrative)
Code(s): N/A | N/A | N/A | N/A | N/A

85a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable
2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	0	0	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A

87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

88. Was this consist transporting passengers? (Y/N): N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote	90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0

91. Equipment Damage This Consist: 0

92. Track, Signal, Way, & Structure Damage: 0

93. Primary Cause Code: N/A

94. Contributing Cause Code: N/A

Number of Crew Members

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
0	0	0	0

Length of Time on Duty

99. Engineer/Operator: Hrs 0 Mi 0

100. Conductor: Hrs 0 Mi 0

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	0	0	0
Nonfatal	0	0	0

104. EOT 1. Yes 2. No: N/A

105. Was EOT Device Properly 1. Yes 2. No: N/A

106. Caboose Occupied by Crew? 1. Yes 2. No: N/A

Highway User Involved

107. A. Auto; B. Truck; C. Truck-Trailer.; D. Pick-Up Truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other (spec. in narrative)
Code: N/A

108. Vehicle Speed (est. MPH at impact): N/A

109. geographical) 1.North 2.South 3.East 4.West
Code: N/A

Rail Equipment Involved

111. Equipment
1.Train(units pulling); 2.Train(units pushing); 3.Train (standing); 4.Car(s) (moving); 5.Car(s) (standing); 6.Light Loco(s) (moving); 7.Light(s) (standing); 8.Other (specify in narrative)
Code: N/A

112. Position of Car Unit in: N/A

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110. Position	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A	1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	N/A
114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A
114c. State here the name and quantity of the hazardous materials released, if any. N/A			

115. Type Crossing Warning	1.Gates 2.Cantilever FLS 3.Standard FLS	4.Wig Wags 5.Hwy. traffic signals 6.Audible	7.Crossbucks 8.Stop signs 9.Watchman	10.Flagged by crew 11.Other (spec. in narr.) 12.None	116. Signaled Crossing (See instructions for codes)	Code	117. Whistle 1. Yes 2. No 3. Unknown	Code
Code(s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code
	N/A		N/A		N/A

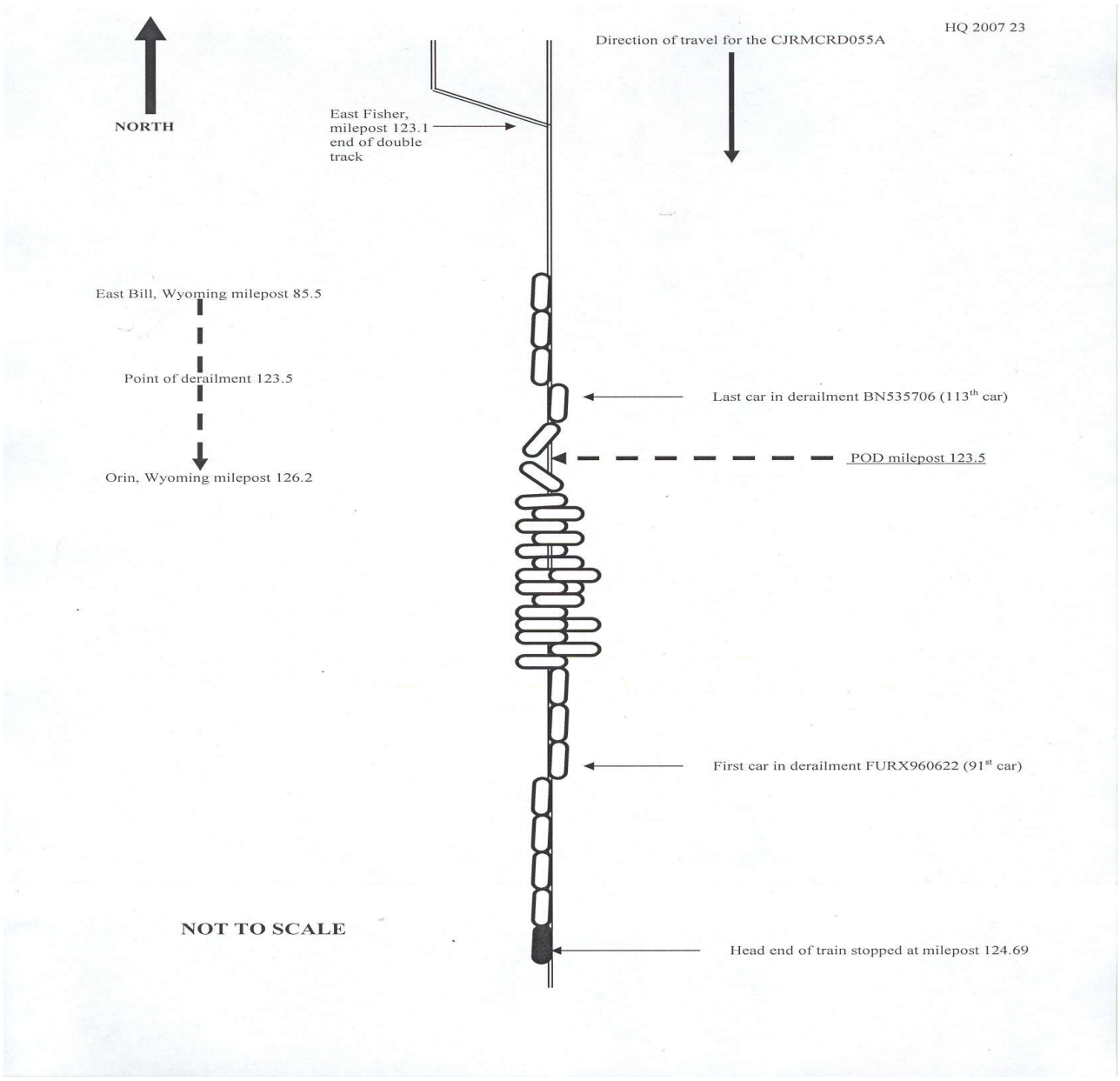
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)	Code
0		N/A		N/A		N/A

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code	126. View of Track Obscured by (primary obstruction) 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed	Code
	N/A		N/A

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				N/A		N/A
129. Highway-Rail Crossing Users	0	0	130. Highway Vehicle Property Damage (est. dollar damage)	0	131. Total Number of Highway-Rail Crossing Users (include driver)	0

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code
	N/A		N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code
	N/A		N/A

136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



137. SYNOPSIS OF THE ACCIDENT

On Wednesday, April 25, 2007, at 1:26 p.m., MDT, an eastbound BNSF Railway Company (BNSF) loaded coal train derailed. The derailment occurred on the Powder River Division, Orin Subdivision at about milepost 123.5. The location of the derailment is about twelve miles southeast of Douglas, WY.

The train consisted of two locomotives on the head end of the train, 128 loaded coal hopper cars, and two locomotives on the rear end of the train. A total of 23 loaded coal hopper cars were involved in the derailment. The derailed cars were the 91st through the 113th car of the train consist.

There was no report of injuries, evacuations or release of hazardous materials.

The reported estimated damage to equipment is $1,090,197 and track is $125,000.

At the time of the accident it was daylight and cloudy. The temperature was 65° F. The rail temperature at the time of the derailment was 92 degrees.

The probable cause of the derailment is track alignment irregular or buckled track.(T109)

The contributing cause of the derailment is Defective spikes or missing spikes or other rail fasteners(T206)

138. NARRATIVE

The following information was obtained from an investigation that was conducted by the Federal Railroad Administration.

Circumstances Prior to the Accident

On April 25, 2007, after completing more than the statutory off duty time, a crew consisting of an engineer and conductor reported for duty at their home terminal, Gillette, Wyoming at 7:40 a.m. MDT. The crew was assigned to operate an eastbound loaded unit coal train from West Nacco to Guernsey, Wyoming, a distance of 108 miles.

The train consisted of four locomotives (two at the head end of the train and two at the rear of the train), 128 loaded coal cars, and 0 empty cars. The length of the train was 7,089 feet with 18,277 trailing tons. The crew went on duty in Gillette and was transported by a crew van to West Nacco, Wyoming. They boarded the train at 9:30 a.m. MDT and departed West Nacco at 9:35 a.m. MDT.

The train approached the accident site traveling geographically south and timetable east direction. Timetable directions will be used throughout this report. The locomotive engineer was seated at the controls of the leading locomotive on the right (south) side of the cab. The conductor was seated on the left (north) side of the leading locomotive cab.

Approaching the accident site from west to east starting at about milepost 122.02 there is tangent track for approximately 3,168 feet, followed by a 2-degree right hand curve for approximately 2,200 feet. From the end of the 2-degree curve to the point of derailment (POD) there is approximately 2,640 feet of tangent track. Beginning at milepost 122.02, the grade of the track is descending on a .30 percent grade in the direction of the train movement. From milepost 122.47 to milepost 123.1 the grade descends at .92 percent. From milepost 123.1 to the POD the grade of the track continues to descend at 1.0 percent.

According to the train crew, the trip had been uneventful until the train approached the accident site.

The Accident

As the train approached the accident site and at the time the accident occurred, the train was being operated at a recorded speed of 45 miles per hour (mph). The speed was recorded by the event recorder of the lead locomotive (BNSF 8831).

The track in the area of the accident is Traffic Control System (TCS) and is controlled by a dispatcher in Fort Worth, Texas. The maximum authorized speed for trains operating on the Orin Subdivision and at the location of the accident is 50 mph as designated in the current BNSF Timetable No. 7.

According to the train crew, as they approached the accident site they both noticed a small thermal misalignment in the track in the area where the POD occurred. While attempting to contact the dispatcher a train line induced emergency air

brake application occurred. The engineer then contacted the dispatcher and advised that their train had gone into emergency. The conductor walked toward the rear of the train per applicable BNSF rules.

Analysis and Conclusion

The accident met the requirement for FRA Post Accident Toxicology Testing, as required under Title 49 CFR, Part 219, Subpart C. The result of the tests were negative.

A total of 23 loaded coal hopper cars were derailed. The derailed cars were the 91st through the 113th car of the train consist.

The investigation revealed that BNSF track maintenance crews removed a switch on September 11, 2006, at milepost 123.6., immediately east of the POD. The turnout was replaced with new concrete tie panels, CWR and anchors.

The existing track on both ends of the newly installed CWR track panel was found to have insufficient anchors in the area of the POD, there was a gap in the track structure not anchored between the new track panel and existing track. The rubber pads between the base of the rail and the top of the concrete tie were found to be deteriorated or missing leaving a void between the base of the rail and the top of the concrete ties in the existing track. The rail was also discovered to be moving 10 to 12 inches longitudinally on both ends of the newly installed track panel area.

BNSF replaced the former turnout with new concrete tie panels, CWR, and rail anchors. They did not adjust the neutral temperature of the existing track on both ends of the new installation. This created a fixed object that ultimately contributed to high compressive forces in the track structure causing the thermal misalignment (sunkink) in the main track.

The latest BNSF rail defect summary report which details defective rail discovered by a rail detector car or service failure rails revealed no defective rail conditions in the immediate area of the accident.

On April 24, 2007 a BNSF track inspector conducted an FRA required track inspection by hi-railing between milepost and 123.1 to milepost 127.2. No defective conditions were noted in the accident area.

The event recorder data indicated that the train was traveling at a recorded speed of 45 mph. The posted speed for the track being operated on was 50 mph. The event recorder data shows no indication of improper train handling. The train was in dynamic brake position 4 and was gradually transitioning from braking to drift.

The lead locomotive in the train was equipped with an on board video recording device which captures video of the track and surrounding right of way as the train is traverses down the track. The DVR Video Snapshot of the immediate area of the accident clearly shows a track alignment irregularity in the area the accident occurred.

A thorough inspection of the derailed equipment revealed no evidence of mechanical defects that would have contributed to the cause of the accident.

FRA obtained fatigue related information, including a 10-day work history, for the engineer and conductor involved in the accident. FRA concluded fatigue was not probable for the conductor or engineer

As a result of the accident the BNSF will identify all areas of similar instances (rail running due to pad deterioration, etc.) and escalated to the division engineer. Results will be prioritized for remedial action.

The BNSF will conduct field audits of all concrete tie locations on the Powder River Division. Also, reviews will be held with maintenance personnel regarding BNSF's requirements pertaining to identification of worn pads and insufficient fasteners. A stand down with all roadmasters, foremen, and inspectors will be done to review this incident. The resulting information will be passed throughout the system to insure similar areas are in compliance. A review with all MOW employees will be done regarding how to identify potential excessive rail movement, the inspection requirements, and the proper remedial actions to apply. Also, employees will conduct monthly hy-rail, ride-alongs and CWR track inspections to ensure work orders are completed and reviewed for accuracy pertaining to CWR issues.

Probable Cause

The contributing cause of the derailment is Defective spikes or missing spikes or other rail fasteners(T206)