Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-31

Burlington Northern Santa Fe (BNSF)
Preston, Oklahoma
May 19, 2006

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-2006-31

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: TX0506106
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident: N/A
3.Name of Railroad Responsible for Track Maintenance: BNSF Rwy Co. [BNSF]	3a. Alphabetic Code: BNSF	3b. Railroad Accident/Incident No.: TX0506106
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 05 / Day 19 / Year 2006	6. Time of Accident/Incident: 05:30: ☐ AM ☑ PM

7. 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): 01

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
0	0	0	0	Texas

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Preston	462.1	N/A	OK	CUSTER

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

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density (gross tons in millions)	24. Time Table Direction 1. North 3. East	Code
Single Main Track		3	0		2

OPERATING TRAIN #1

25. 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: 1

26. Was Equipment Attended? 1. Yes 2. No — Code: 1

27. Train Number/Symbol: CEBM MAHO 32

28. Speed (recorded speed, if available) — Code: R (R - Recorded; E - Estimated) 21 MPH

29. Trailing Tons (gross tonnage, excluding power units): 19846

30. 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): j N/A N/A N/A N/A

30a. 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: 2

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	113	yes
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A

32. 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

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

34. 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

35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	139	0	0	0	0
(2) Total Derailed	27	0	0	0	0

36. Equipment Damage — This Consist: 136186

37. Track, Signal, Way, & Structure Damage: 115000

38. Primary Cause Code: T109

39. Contributing Cause Code: N/A

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	N/A	1	N/A

Length of Time on Duty

44. Engineer/Operator: Hrs 3 Mi 15

45. Conductor: Hrs 3 Mi 15

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	0

49. EOT Device? 1. Yes 2. No: 1

50. Was EOT Device Properly Armed? 1. Yes 2. No: 1

51. Caboose Occupied by Crew? 1. Yes 2. No: 2

OPERATING TRAIN #2

52. 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

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

54. Train Number/Symbol: N/A

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

57. Method(s) of Operation (enter code(s) that apply): a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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56. Trailing Tons (gross tonnage, excluding power units): N/A

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

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

59. 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

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

61. 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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

62. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Equipment Damage This Consist: 0

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

65. Primary Cause Code: N/A

66. Contributing Cause Code: N/A

Number of Crew Members

67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

71. Engineer/Operator: Hrs 0 Mi 0

72. Conductor: Hrs 0 Mi 0

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

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

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

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

Highway User Involved

79. Type: 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

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

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

82. Position: 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped — Code: N/A

86a. 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 — Code: N/A

Rail Equipment Involved

83. 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

84. Position of Car Unit in Train: N/A

85. Circumstance: 1. Rail Equipment Struck Highway User; 2. Rail Equipment Struck by Highway User — Code: N/A

86b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: N/A

86c. State here the name and quantity of the hazardous materials released, if any.
N/A

87. Type of 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

Code(s)							
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

88. Signaled Crossing Warning (See instructions for codes) — Code: N/A

89. Whistle Ban 1. Yes 2. No 3. Unknown — Code: N/A

90. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — Code: N/A

91. Crossing Warning Interconnected with Highway Signals 1. Yes 2. No 3. Unknown — Code: N/A

92. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown — Code: N/A

93. Driver's Age: 0

94. Driver's Gender 1. Male 2. Female — Code: N/A

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown — Code: N/A

96. 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: N/A

97. Driver Passed Standing Highway Vehicle 1. Yes 2. No 3. Unknown — Code: N/A

98. 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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	0	0

99. Driver Was 1. Killed 2.Injured 3. Uninjured — Code: N/A

100. Was Driver in the Vehicle? 1. Yes 2. No — Code: N/A

102. Highway Vehicle Property Damage (est. dollar damage): 0

103. Total Number of Highway-Rail Crossing Users (include driver): 0

104. Locomotive Auxiliary Lights? 1. Yes 2. No — Code: N/A

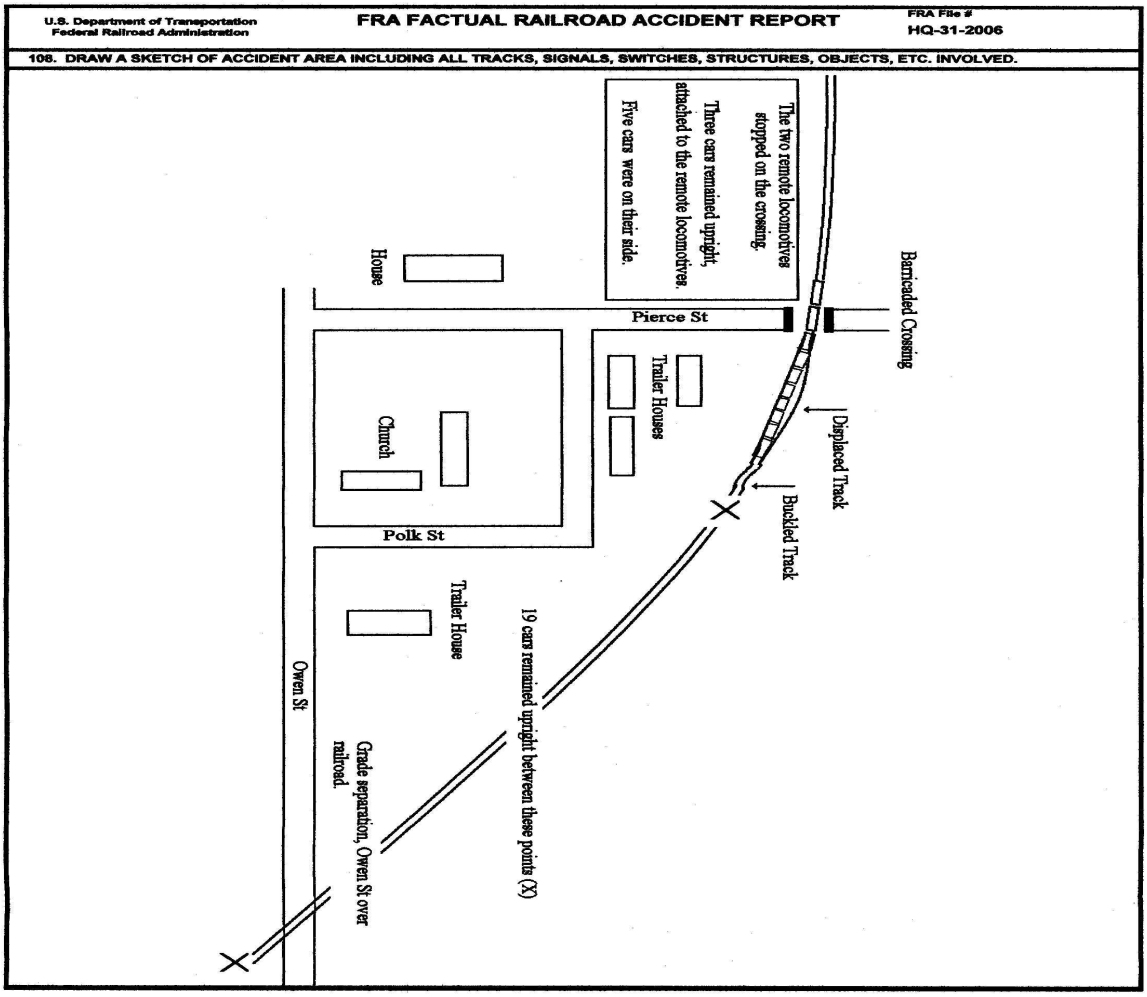
105. Locomotive Auxiliary Lights Operational? 1. Yes 2. No — Code: N/A

106. Locomotive Headlight Illuminated? 1. Yes 2. No — Code: N/A

107. Locomotive Audible Warning Sounded? 1. Yes 2. No — Code: N/A

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

HQ-31-2006.jpg



109. SYNOPSIS OF THE ACCIDENT

A southbound BNSF freight train derailed on May 19th, 2006, at approximately 5:30 p.m. The accident occurred in Preston, Oklahoma, at BNSF Milepost 462.1, on the BNSF Creek Subdivision.

27 cars derailed, 22 remained upright with five turned over on their side. Two remote locomotives directly behind the derailed cars remained on the track. There were no injuries to the train crew. There was extensive damage to track, roadbed, and equipment totaling about $228,000.

At the time of the accident it was daylight and clear, with a south wind about 13 mph. The temperature was 98º F.

The accident was caused by issues with rail anchors and ballast, coupled with high temperatures, resulting in a sun kink which caused the derailment.

110. NARRATIVE

Circumstances Prior to the Accident

At 5:30 a.m. CST, on May 19, 2006, a Burlington Northern Santa Fe Railway (BNSF) track maintenance employee reported for work near Preston, Oklahoma. The track maintenance employee, an assistant foreman of a tie replacement crew, was assigned to coordinate operations between train movements and track forces through the limits of a Form 'B' track bulletin. Other duties included operating a hi-rail vehicle for the purpose of inspecting track, ballast, and ties to determine speed restrictions for trains and equipment moving through the area.

After attending to a required job briefing the maintenance employee assumed his duties by contacting the train dispatcher and requesting authority to allow track forces to commence work within the limits of the Form 'B'. He then proceeded to install markers at opposing boundaries of the limits prior to placing his hi-rail vehicle on the track to inspect conditions in order to determine what speed restrictions would be necessary to allow trains to travel safely through the limits.

At 2:15 p.m. on the day of the accident, a BNSF train crew consisting of a conductor, an engineer, and a student engineer reported for duty at the Cherokee Yard in Tulsa, Oklahoma. The crew attended to necessary paperwork and held a job briefing prior to boarding the southbound C-EBMMAHO-32. Tulsa is the home terminal for all members of the crew and all received more than the statutory off duty period prior to reporting for duty.

Their assigned freight train consisted of two lead locomotives, 139 loaded cars of coal, and two remote locomotives located at the rear. The train, scheduled to travel to Madill, Oklahoma, was 7675 feet long, and weighed 19846 tons.

The crew proceeded south from the Cherokee Yard to the siding at Kiefer where they stopped prior to entering the limits of a form 'B' track bulletin. After receiving permission to enter the limits from the employee in charge of the work group, the train crew proceeded to move their train south at maximum authorized speed of 25 mph. The train crew received a good "roll by" from track maintenance employees indicating there were not any noticeable defective conditions of the train or locomotives.

In this area of the railroad the track is tangent for approximately one mile, followed by a 3º curve of 550 feet to the right to the point of derailment, and about one mile beyond. There are in succession a .7% ascending grade for about 550 feet followed by a .86% ascending grade for approximately .6 mile to the crest of the hill, then a descending grade of .83% for approximately 2100 feet, a 1% descending grade for about 1000 feet, and another .85% descending grade for over one mile. The crest of the hill is approximately 2000 feet past the point of derailment.
The railroad timetable direction of the train was south. The geographic direction was southwest. Timetable directions are used throughout this report.

The Accident

The BNSF C-EBMMAHO-32 southbound train began to ascend a hill as it approached Preston and could not reach the maximum authorized speed of 25 mph. The student locomotive engineer was seated at the controls of the lead locomotive and the engineer was seated behind the conductor on the left side of the locomotive.

The train crew's view was unobstructed as they approached a highway-rail grade crossing at the BNSF Milepost 462.1. The crossing warning devices consisted of flashing lights and bells and were operational, although the crossing was closed to vehicle traffic and the crossing planks removed to be replaced during the rail upgrade project.

The student locomotive engineer utilized the dynamic brakes of the lead locomotives to control the train as the head end passed over the crest of the hill and started to pick up speed, at the same time he used the remote locomotives to push the rear portion of the train up the hill. As the middle section of the train approached the

crest of the hill the train began to pick up more speed and the student engineer placed the lead locomotives into full dynamic braking mode. The train proceeded without incident and the crew did not experience any defective conditions of the track as they progressed through the area.

Suddenly there was an automatic emergency application of the train brakes. There was no slack action as the train came smoothly to a stop and the crew concluded that there had been a malfunction of the train brake system, or possibly an interruption with communication between the lead locomotive and the remote locomotives at the rear of the train. They did not anticipate that there had been a derailment or other incident.

The track maintenance employee in charge of the form 'B' track bulletin limits had placed his hi-rail vehicle on the track approximately four miles behind the southbound train as it progressed, and proceeded to follow the train as he inspected track conditions. As he came through a right curve of the track he noticed the remote locomotives stopped at the highway-rail grade crossing in Preston, and noted coal cars in front of the locomotives were off the track and on their side.

The employee contacted the train crew via radio and inquired if they were aware of the condition of their train, informing them that a derailment had occurred. He then removed his hi-rail vehicle from the track and drove to the crossing location where the cars were derailed. When he arrived he noted that portions of the track had been displaced from the ties and a section of track had buckled into an 'S' shape approximately 500 feet south of the crossing.

After the crew received information that cars on their train had derailed, the conductor proceeded toward the rear of the train to investigate while the engineer and student engineer remained on the lead locomotive. The engineer contacted the dispatcher and informed him that an incident had occurred and awaited further instructions. Soon the BNSF terminal manager arrived from Tulsa and escorted the engineer to the rear of the train for questioning.

When they arrived at the rear of the train the engineer joined the conductor along with police and EMS personnel who were present. The track maintenance employee who first observed the derailed cars was also present.

Analysis and Conclusions

Analysis

The highway-rail grade crossing at milepost 462.1 had been blockaded to prevent any vehicle traffic while the crossing was being dismantled and renewed. At the time of the derailment there were new ties, tie plates, spikes, and rail anchors installed through the crossing location, which was to receive new concrete planks that were not installed at the time of the derailment. The track maintenance employee had inspected the track, ties, and ballast through the area prior to allowing trains to travel through the limits of the Form 'B' track bulletin.

The two remote locomotives at the rear of the train did not derail but stopped on the highway-rail grade crossing. Three cars directly in front of the locomotives derailed but remained upright, the next five cars derailed and were laying on their side. The rail was displaced from the ties between the leading wheels of the locomotives and a buckled section of track approximately 500 feet to the south. The five cars that turned over and three upright cars connected to the rear locomotives were located in the portion of track with displaced rail.

A separation of approximately 25 feet existed between these eight cars and the remaining train, the buckled section of track was located in this separation between the cars. The 19 derailed cars to the south of the buckled section of track were upright and were coupled to the remaining portion of the train. The forward wheels of each set of trucks on each car derailed, the remaining wheels were still on the track.

The railroad incident report places the point of derailment (POD) at BNSF Milepost 462.1, the crossing is located at milepost 462.18. The area near the incident is within the Preston town limits. Trailer houses, houses, and a church are in close proximity to the derailment site. There were no injuries to local inhabitants or railroad employees, a toxicology test was not performed on the train crew or other railroad employees.

Conclusions

The train crew was in full compliance with their own policies and procedures along with all applicable Federal standards. The locomotive engineer of the southbound train had been closely observing the operating practices of the student engineer and did not note any exceptions to his actions. The train was traveling at 21 mph (recorded speed).

The assistant foreman in charge of the Form 'B' track bulletin limits was cited for "improper slow speed was given to train crew considering the temperature and lack of ballast in the tie cribs and on the high side of the curve and the fact the surfaced track had not been stabilized with track stabilizer" and " Failure to comply with.....previous instructions that the first train over surfaced track would be operated at 10 MPH if the track stabilizer was not working". He received discipline from the railroad company in the form of "a level 5, 30-day Record Suspension for violation of Engineering Instructions 4.5.1".

Another track maintenance employee, a foreman, was also cited and received similar discipline. He has since retired from railroad employment.

Probable Cause & Contributing Factors

Upon investigation by the Federal Railroad Administration it was found that the accident occurred because of issues with rail anchors and ballast coupled with high temperatures which resulted in sun kink.