Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-31

BNSF Railway (BNSF)
Pueblo, Colorado
April 9, 2005

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-2005-31

1.Name of Railroad Operating Train #1: BURLINGTON NORTHERN SANTA FE CORPORATION	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: PR0405107
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.: PR0405107
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 04 / Day 09 / Year 2005	6. Time of Accident/Incident: 11:50: ☐ 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
8	4	0	0	Powder River

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Pueblo	122.0	N/A	CO	PUEBLO

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
53 F		4		2		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		2	38.24		1

OPERATING TRAIN #1

25. Type of Equipment Consist (single entry)	A. Spec. MoW Equip.	Code	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
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		1	1	1	MSLA DEN10

28. Speed (recorded speed, if available) R - Recorded E - Estimated 12 MPH | Code: R

29. Trailing Tons (gross tonnage, excluding power units): 6286

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 South, 4 West: 7 | 0

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	3	N/A
(2) Causing (if mechanical cause reported)	CSXT4786	3	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	4	0	0	0	0
(2) Total Derailed	2	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	49	0	4	0	0
(2) Total Derailed	25	0	2	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
207063	321375	E63L	N/A

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	0	1	1

Length of Time on Duty

44. Engineer/Operator	45. Conductor
Hrs 7 Mi 20	Hrs 7 Mi 20

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

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

OPERATING TRAIN #2

52. Type of Equipment Consist (single entry)	A. Spec. MoW Equip.	Code	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
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		N/A	N/A	N/A	N/A

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

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

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First involved (derailed, struck, etc)	0	0	N/A		N/A	N/A
(2) Causing (if mechanical cause reported)	0	0	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	62. Cars	Loade a. Freight	Loade 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

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
0	0	N/A	N/A

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen	71. Engineer/Operator	72. Conductor
0	0	0	0	Hrs 0 Mi 0	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?	77. Was EOT Device Properly Armed?	78. Caboose Occupied by Crew?
1. Yes 2. No N/A	1. Yes 2. No N/A	1. Yes 2. No N/A

Highway User Involved

79. Type	Code
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)	N/A

80. Vehicle Speed (est. MPH at impact)	81. Direction geographical) 1.North 2.South 3.East 4.West	Code
N/A		N/A

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

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?	Code
1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A

Rail Equipment Involved

83. Equipment	Code
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)	N/A

84. Position of Car Unit in Train
N/A

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

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

88. Signaled Crossing Warning (See instructions for codes)	Code

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

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

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

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

93. Driver's Age	94. Driver's Gender	Code
0	1. Male 2. Female	N/A

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

96. Driver	Code
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)	N/A

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

98. View of Track Obscured by (primary obstruction)	Code
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	N/A

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

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

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

102. Highway Vehicle Property Damage (est. dollar damage)	103. Total Number of Highway-Rail Crossing Users (include driver)
0	0

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

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

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

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

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

HQ-31_Sketch Statement.jpg

Regarding Sketch for HQ-31-2005:

Due to severe weather (snow storm) the interstate highway was closed for 36 hours, which prevented the FRA from getting to the accident site before the derailment was cleared. See Attachment, BNSF Derailment Sheet for sketch of the accident area.

109. SYNOPSIS OF THE ACCIDENT

A northbound BNSF freight train derailed south of Southern Junction, 4 miles south of Pueblo, Colorado, on April 9, 2005, at 11:50 p.m. MDT. The accident occurred at BNSF Milepost 122.0, on the Spanish Peak Subdivision of the Powder River Division.

There were 2 locomotives and 26 cars derailed. Four hazmat cars were derailed, up-right and not compromised. There were no injuries related to the incident, no hazardous material involved, and no evacuation was necessary.

At the time of the accident, the weather was clear and windy. The temperature was 53 °F. The total estimated damage is approximately $528,438.

The probable cause of this accident was a broken wheel; resulting from a pre-existing fracture through the wheel hub of the left No. 5 wheel, on Locomotive No. CSXT 4786.

110. NARRATIVE

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

Circumstances Prior to the Accident

The crew of Train Symbol M-SLADEN1-07 included a locomotive engineer, a conductor, and brakeman. They first went on duty at 4:30 p.m., MDT, April 9, 2005, at the Trinidad Terminal, in Trinidad, Colorado. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty

Their assigned freight train consisted of four locomotives, one being moved under the requirements of 49 CFR Part 229.9 (noncomplying conditions), with 49 loads and 4 empties. It was 3,189 feet in length, and weighed 6,286 tons. The train departed Trinidad and was scheduled to travel to Denver, Colorado. The train received the required train air brake test, and departed Trinidad Yard at 5:59 p.m.

As the northbound train approached the accident area, the locomotive engineer was seated at the controls on the east side of the leading locomotive, No. BNSF 4496. The conductor was positioned on the west side and the head brakeman was seated in the center of the cab of the leading locomotive.

In the area of the railroad where the accident occurred there is a tangent main line track running through a cut, with dirt banks and drainage ditches on both sides. The grade at this location is a 0.50 percent descending grade and played no part in the derailment.

The railroad timetable direction was north. The geographic direction was northeast. Timetable directions are used throughout this report.

The Accident

The train was leaving a 10-mph speed restriction and was being operated between 8 and 12 mph approaching the accident area. At the time the accident occurred, the train was being operated at 12 mph. The maximum authorized speed at this location is 20 mph, as designated in the current BNSF Timetable No. 6 in effect April 28, 2004. Both speeds were recorded by the event recorder of the controlling Locomotive No. BNSF 4496. The train crew indicated that they felt a violent bump when the third and fourth locomotives and 26 cars in the train derailed. The engineer then looked to the rear of the train and discovered the cars and locomotives were dragging upright and off the track. Shortly thereafter, the train went into an emergency train air brake application. It was later discovered that the left No. 5 wheel hub on the third locomotive, No. CSXT 4786, had broken.

Analysis and Conclusions

Analysis

The BNSF Railway conducted an examination of the wheel set at their test research and development laboratory in Topeka, Kansas. Examination of the wheel set revealed a pre-existing fracture of the left No. 5 wheel hub. This fracture originated at the outer corner of the hub and progressed to the depth of approximately 2 3/4 inches. The presence of such a fracture would significantly reduce the clamping force of the wheel hub on the axle.

Conclusion

The railroad was in compliance with their own, and all applicable Federal standards. There is no indication that this defect could have been detected during the installation of the wheel or during routine locomotive inspections.

Probable Cause & Contributing Factor

The FRA determined that the probable cause of this accident was a broken wheel; resulting from a pre-existing fracture through the wheel hub of the left No. 5 wheel, on Locomotive No. CSXT 4786.