Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-16

Burlington Northern Santa Fe (BNSF)
Ismay, Montana
March 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-2006-16

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: MT0306103
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.: N/A
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident: Month 03 / Day 19 / Year 2006	6. Time of Accident/Incident: 09:55: ☐ 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	Montana

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Ismay	1047.6	N/A	MT	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
23 F		4		6		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		3	11.39		3

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	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
	1	1. Yes	1	CEBMS PCO27

28. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	30. Method(s) of Operation (enter code(s) that apply)	30a. Remotely Controlled Locomotive?
40 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) Code(s): i, j, N/A, N/A, N/A	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 2. South 4. West; 3 = Remote control transmitter - more than one remote control transmitter: 0

29. Trailing Tons (gross tonnage, excluding power units): 16317

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	44	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
0	0

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	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	115	0	0	0	0
(2) Total Derailed	29	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
1198228	72000	T215	N/A

Number of Crew Members

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

Length of Time on Duty

44. Engineer/Operator	45. Conductor
Hrs 4 Mi 10	Hrs 4 Mi 10

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) 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	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
	N/A	1. Yes	N/A	N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	57. Method(s) of Operation (enter code(s) that apply)	57a. 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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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
N/A			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	N/A	N/A		N/A	N/A
(2) Causing (if mechanical cause reported)	0	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	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
N/A	N/A	N/A	N/A	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: N/A
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)

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

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

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

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

Rail Equipment Involved

83. Equipment — Code: N/A
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)

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

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

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

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

87. Type of Crossing Warning	88. Signaled Crossing Warning (See instructions for codes) Code	89. Whistle Ban Code
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	N/A	1. Yes 2. No 3. Unknown N/A
Code(s): N/A N/A N/A N/A N/A N/A N/A		

90. Location of Warning Code	91. Crossing Warning Interconnected with Highway Signals Code	92. Crossing Illuminated by Street Lights or Special Lights Code
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach N/A	1. Yes 2. No 3. Unknown N/A	1. Yes 2. No 3. Unknown N/A

93. Driver's Age	94. Driver's Gender Code	95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code	96. Driver Code
0	1. Male 2. Female N/A	1. Yes 2. No 3. Unknown N/A	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

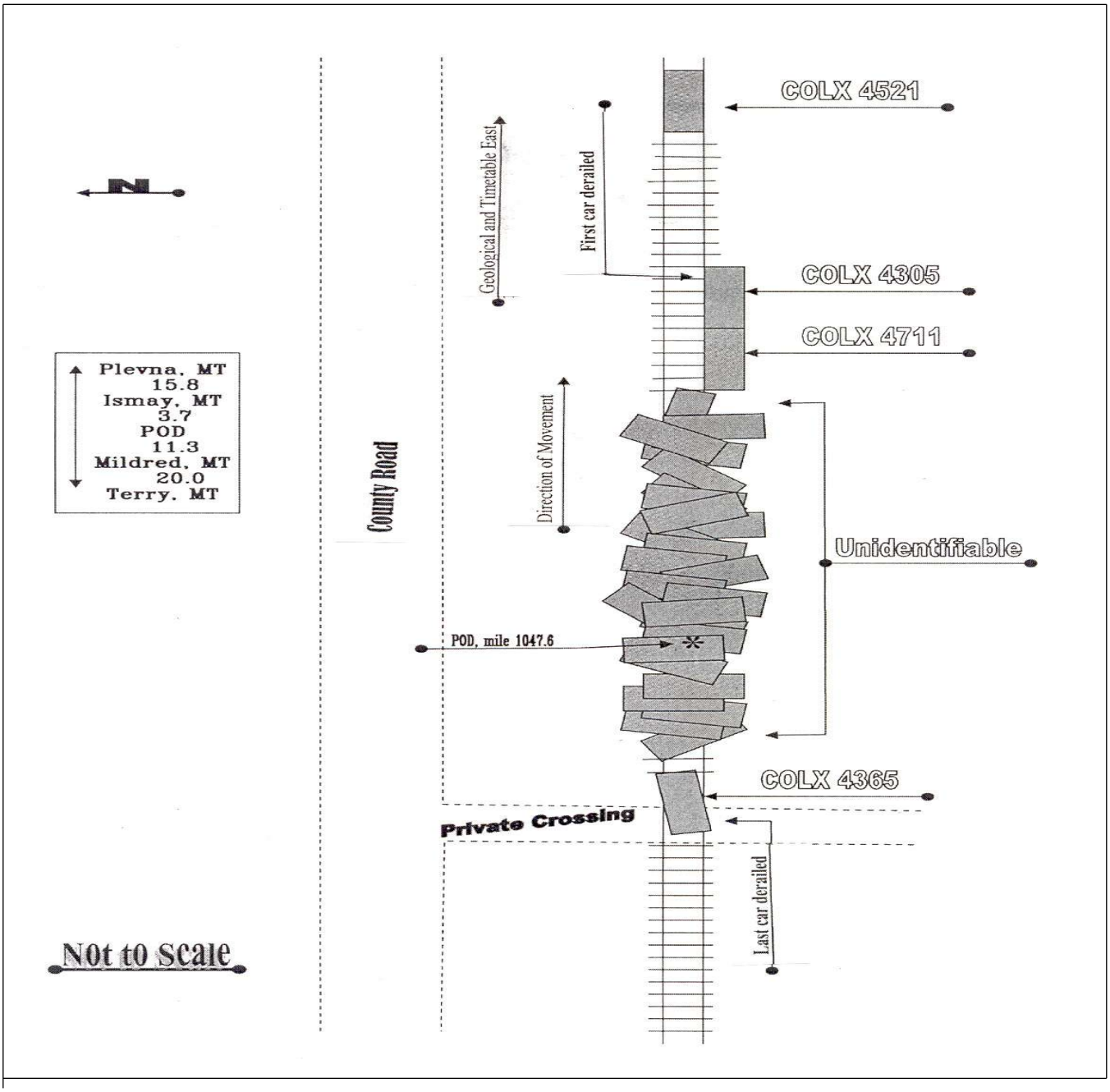
97. Driver Passed Standing Highway Vehicle Code	98. View of Track Obscured by (primary obstruction) Code
1. Yes 2. No 3. Unknown N/A	1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed N/A

101. Casulties to Highway-Rail Crossing Users	Killed	Injured	99. Driver Was Code	100. Was Driver in the Vehicle? Code
	0	0	1. Killed 2.Injured 3. Uninjured N/A	1. Yes 2. No 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? Code	105. Locomotive Auxiliary Lights Operational? Code
1. Yes 2. No N/A	1. Yes 2. No N/A
106. Locomotive Headlight Illuminated? Code	107. Locomotive Audible Warning Sounded? Code
1. Yes 2. No N/A	1. Yes 2. No N/A

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

HQ-16-2006 sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

On March 19, 2006, at 9:55 p.m. (MST), an eastbound BNSF Railway Company (BNSF) loaded coal train (C-EBMSPCO-27) derailed on the Montana Division, Hettinger Subdivision approximately 3.7 miles west of Ismay, Montana, milepost 1047.6. The train was traveling on a single main track at a recorded speed of 40 mph. The maximum authorized timetable track speed in the area of the accident is 40 mph.

The train consisted of four locomotives, 115 railcars of coal, 16,317 trailing tons and was 6,390 feet in length. A total of 29 cars, 40th through the 68th, derailed. There were no injuries reported and no release of hazardous materials. The estimated damage of the derailment was $1,270,228 ($72,000 track and $1,198,228 equipment).

At the time of the derailment it was dark, windy with snow. The temperature was 23°F.

The probable cause of the accident was broken non-insulated rail joint bars (T215).

110. NARRATIVE

Circumstances Prior to the Accident

On March 19, 2006, after completing more than the statutory off duty time, a crew consisting of an engineer and conductor reported for duty at their home terminal at Forsyth, Montana, at 5:45 p.m. (MST). The crew was assigned to operate eastbound BNSF unit coal train symbol C-EBMSPCO-27, from Forsyth to Hettinger, South Dakota, a distance of 237 miles.

The train consisted of four locomotives, 115 railcars of coal, 16,317 trailing tons and was 6,390 feet in length and had received a Class 1A air brake inspection by BNSF Carmen at Mandan, North Dakota.
According to the crew, the engineer performed a daily locomotive inspection before departing. The crew boarded the train and departed Forsyth at 6:00 p.m. (MST).

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

Approaching the accident site from the west at milepost 1049, there is in succession, a 2-degree curve to the left 1,188 feet in length, tangent 2,508 feet in length, a 1-degree curve to the right 1,716 in length, 1,980 feet of tangent to the point of derailment and 5,280 feet beyond. The grade at the accident area is 0.25 percent ascending.

According to the crew, as the train approached the accident area, the trip was uneventful and the weather was dark, cold with blowing snow.

The Accident

As the train approached the accident site and at the time the accident occurred, the train was being operated at 40 mph. The speed was recorded by the event recorder of the controlling locomotive. In the accident area, trains operate on a single main track under the authority of a Track Warrant Control System (TWC), controlled by a dispatcher located in Fort Worth, Texas. The maximum authorized speed for freight trains is 40 mph as designated in the current BNSF Timetable Montana Division No. 6.

According to the train crew there was no observation of any unusual track condition. The crew stated that shortly after passing over a private grade crossing, they suddenly felt the lead locomotive sway to the right. They were preparing to inform the dispatcher of the location of the rough spot when the train experienced a train line induced emergency air brake application and came to a stop in1,737 feet. After coming to a stop the conductor left the locomotive to investigate and observed that a portion of the train had derailed. The engineer immediately contacted the dispatcher, and advised that the train was stopped and derailed.

Analysis and Conclusions

This accident met the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing and the crew was tested. The test results were negative.

On March 17, 2006, a BNSF track inspector conducted a track inspected by traversing the track with a hi-rail vehicle between milepost 995 and milepost 1078.9. No defective conditions were noted in the accident area.

On October 6, 2005, the BNSF track Geometry Test Car (Car 85) conducted a test through the accident area and detected gage measurements of 57 5/16-inches, at milepost 1047.576. The gage measurement meets the Federal Track Safety Standards requirements for FRA Class 3 track of 57 3/4-inches.

On March 1, 2006, the BNSF conducted an internal rail inspection in the area of the accident from milepost 1046 to milepost 1073.6. No exceptions were noted.

Wheels of two cars ahead of the first car derailed contained marks on the tread section of the wheel. They appeared to have been caused by impacting the end of a rail.

During the investigation, a rail end section was recovered with broken rail joint bars still attached. The joint bars were broken in the center. The mating pieces of rail end and rail joint bars were not found. The rail end section and the broken joint bars exhibited signs of excessive wheel batter. The bottom section of the rail joint bars appeared to have metallurgy defects on the broken face. The recovered rail joint bars were sent to a lab for further analysis.

The severely battered rail end and joint bars indicate the joint bars were center broke causing catastrophic failure in the track structure resulting in the derailment of the coal train.

Probable Cause

The probable cause of the accident was broken non-insulated rail joint bars (T215).