



***Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-43***

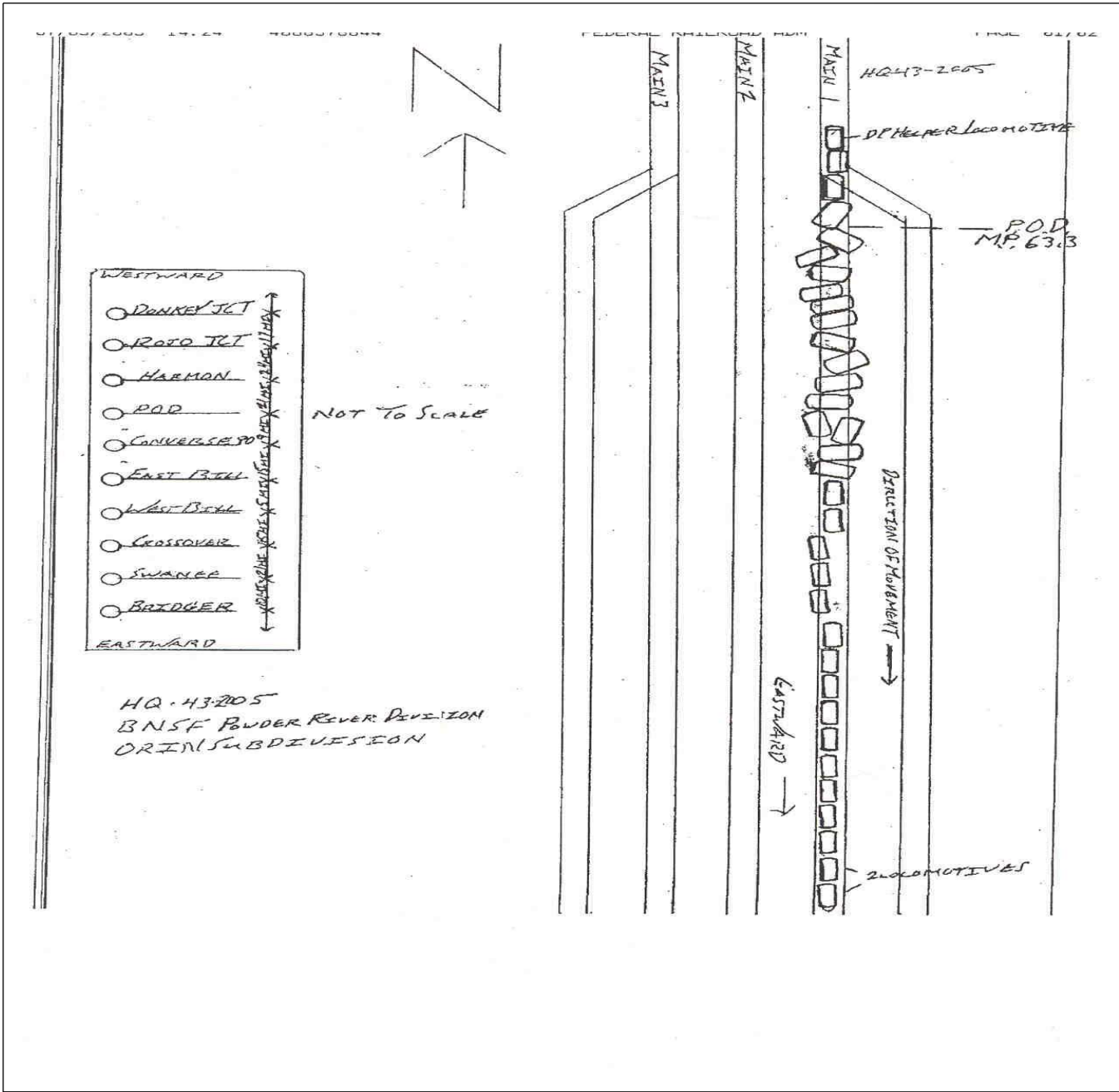
***Union Pacific (UP)
Bill, Wyoming
May 15, 2005***

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.

1. Name of Railroad Operating Train #1 Union Pacific RR Co. [UP]		1a. Alphabetic Code UP		1b. Railroad Accident/Incident No. 0505NP012	
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: Union Pacific RR Co. [UP]		3a. Alphabetic Code UP		3b. Railroad Accident/Incident No. 0505NP012	
4. U.S. DOT_AAR Grade Crossing Identification Number		5. Date of Accident/Incident Month Day Year 05 15 2005		6. Time of Accident/Incident 05:30: <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	
7. Type of Accident/Incident (single entry in code box) 1. Derailment 4. Side collision 7. Hwy-rail crossing 10. Explosion-detonation 13. Other (describe in narrative) 2. Head on collision 5. Raking collision 8. RR grade crossing 11. Fire/violent rupture 3. Rear end collision 6. Broken Train collision 9. Obstruction 12. Other impacts 01					
8. Cars Carrying HAZMAT 0	9. HAZMAT Cars Damaged/Derailed 0	10. Cars Releasing HAZMAT 0	11. People Evacuated 0	12. Division Powder River	
13. Nearest City/Town Bill		14. Milepost (to nearest tenth) 63.3	15. State Abbr Code N/A WY	16. County CAMPBELL	
17. Temperature (F) (specify if minus) 47 F	18. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 1	19. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 1	20. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1		
21. Track Name/Number Main Track No. 1		22. FRA Track Code Class (1-9, X) 4	23. Annual Track Density (gross tons in millions) 111	24. Time Table Direction Code 1. North 3. East 3	
OPERATING TRAIN #1					
25. Type of Equipment Consist (single entry) 1. Freight train 4. Work train 7. Yard/switching 2. Passenger train 5. Single car 8. Light loco(s). 3. Commuter train 6. Cut of cars 9. Maint./inspect.car	A. Spec. MoW Equip. Code 1	26. Was Equipment Attended? 1. Yes 2. No 1	27. Train Number/Symbol CCAIM 9-14		
28. Speed (recorded speed, if available) Code R - Recorded E - Estimated 48 MPH R	29. Trailing Tons (gross tonnage, excluding power units) 18066	30. Method(s) of Operation (enter code(s) that apply) a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track c. Auto train stop i. Time table/train orders o. Positive train control d. Cab j. Track warrant control p. Other (Specify in narrative) Code(s) e. Traffic k. Direct traffic control f. Interlocking l. Yard limits			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 0
31. Principal Car/Unit (1) First involved (derailed, struck, etc) (2) Causing (if mechanical cause reported)	a. Initial and Number N/A	b. Position in Train 63	c. Loaded (yes/no) yes	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 (1) Total in Train (2) Total Derailed	a. Head End 2	b. Mid Train 0	c. Remote 0	d. Manual 0	e. Caboose 0
35. Cars (1) Total in Equipment Consist (2) Total Derailed	a. Freight 130	b. Pass. 0	c. Freight 0	d. Pass. 0	e. Caboose 0
36. Equipment Damage This Consist 685307.	37. Track, Signal, Way, & Structure Damage 237000.	38. Primary Cause Code T201	39. Contributing Cause Code N/A		
Number of Crew Members			Length of Time on Duty		
40. Engineer/Operators N/A	41. Firemen 0	42. Conductors 1	43. Brakemen 0	44. Engineer/Operator Hrs 3 Mi 40	45. Conductor Hrs 3 Mi 40
Casualties to:	46. Railroad Employees 0	47. Train Passengers 0	48. Other 0	49. EOT Device? 1. Yes 2. No 2	50. Was EOT Device Properly Armed? 1. Yes 2. No N/A
Nonfatal	N/A	0	0	51. Caboose Occupied by Crew? 1. Yes 2. No	N/A
OPERATING TRAIN #2					
52. Type of Equipment Consist (single entry) 1. Freight train 4. Work train 7. Yard/switching 2. Passenger train 5. Single car 8. Light loco(s). 3. Commuter train 6. Cut of cars 9. Maint./inspect.car	A. Spec. MoW Equip. Code N/A	53. Was Equipment Attended? 1. Yes 2. No N/A	54. Train Number/Symbol N/A		
55. Speed (recorded speed, if available) Code R - Recorded E - Estimated 0 MPH N/A	57. Method(s) of Operation (enter code(s) that apply) a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track	57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled 1 = Remote control portable			

56. 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					
58. Principal Car/Unit (1) First involved (derailed, struck, etc) 0		a. Initial and Number 0		b. Position in Train 0		c. Loaded(yes/no) N/A		59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box. Alcohol: N/A Drugs: 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 c. Remote		Rear End d. Manual c. Remote		62. Cars		Loade a. Freight b. Pass. c. Freight d. Pass. e. Caboose			
(1) Total in Train 0		0		0		0		(1) Total in Equipment Consist 0		0			
(2) Total Derailed 0		0		0		0		(2) Total Derailed 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		Length of Time on Duty			
67. Engineer/Operators 0		68. Firemen 0		69. Conductors 0		70. Brakemen 0		71. Engineer/Operator Hrs 0 Mi 0		72. Conductor Hrs 0 Mi 0			
Casualties to:		73. Railroad Employees		74. Train Passengers		75. Other		76. EOT Device? 1. Yes 2. No N/A		77. Was EOT Device Properly Armed? 1. Yes 2. No N/A			
Fatal 0		0		0		0		78. Caboose Occupied by Crew? 1. Yes 2. No		N/A			
Nonfatal 0		0		0		0							
Highway User Involved						Rail Equipment Involved							
79. Type C. Truck-Trailer. F. Bus J. Other Motor Vehicle A. Auto D. Pick-Up Truck G. School Bus K. Pedestrian B. Truck E. Van H. Motorcycle M. Other (spec. in narrative) Code N/A		80. Vehicle Speed (est. MPH at impact) 0		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		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 0		85. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User 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						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 1. Gates 2. Cantilever FLS 3. Standard FLS Code(s) N/A		4. Wig Wags 5. Hwy. traffic signals 6. Audible N/A		7. Crossbucks 8. Stop signs 9. Watchman N/A		10. Flagged by crew 11. Other (spec. in narr.) 12. None 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 Code N/A		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) Code N/A											
101. Casualties to Highway-Rail Crossing Users		Killed 0		Injured 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		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.
sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

On May 15, 2005, at 5:30 a.m., MDT, eastbound Union Pacific Railroad Company (UP) loaded coal Train Symbol CCAIM9-14, derailed 29 cars approximately 18 miles west of Bill, Wyoming. The train was operating on Main Track No. 1 of the BNSF Railway Company (BNSF) Orin Subdivision, Powder River Division.

As a result of the accident, 27 of the derailed cars were destroyed (two were re-railed and forwarded to a repair facility) and 1,282 feet of track was destroyed. UP reported \$685,307 equipment damage and BNSF reported \$237,000 track and signal damage. There was no hazardous material released, no evacuation, and no injury.

At the time of the accident it was dawn, clear, and the ambient temperature was 47 °F.

The probable cause of the accident was a broken rail: a bolt hole crack in the outermost bolt hole that ran 11 inches to the adjoining field weld, then broke upward through the ball of the rail.

110. NARRATIVE

Circumstances Prior to the Accident

The train crew included a locomotive engineer and a conductor. They first went on duty at 1:50 a.m., MDT, May 15, 2005, at Bill, Wyoming. This was the home terminal for both crew members and they had both received more than the statutory off-duty period, prior to reporting for duty.

They were assigned to relieve the crew of Train Symbol CCAIM9-14 at milepost 45.2, and operate the train to Bill, a distance of 40.3 miles. The track the train was to operate over was owned by BNSF, so the UP train was required to operate in accordance with the host railroad's Timetable and Rules.

The train consisted of two leading locomotives, 130 loaded coal cars, and one remotely controlled locomotive on the rear end. The required air test was performed and they departed milepost 45.2 at approximately 3 a.m.

As the train proceeded eastward, the engineer was seated, operating the controls, on the south side of the leading locomotive. The conductor was seated on the north side of the leading locomotive.

In the area of the derailment, trains operate on three main tracks, designated as Main Track No. 1, Main Track No. 2 and Main Track No. 3; and are controlled by signal indication of a Traffic Control System (TCS) controlled by a dispatcher located in Fort Worth, Texas. The train was traveling eastward on Main Track No. 1 at the time of the derailment.

Approaching the accident site from west to east, there were, in succession, a tangent approximately 3,960 feet in length, followed by a 3-degree 0-minute left curve approximately 2,376 feet in length, and a tangent of approximately 560 feet to the point of derailment and 2,640 feet beyond. The grade approaching the accident area was descending at 0.88 percent to milepost 62.4, then ascending at 0.60 percent through the accident area and beyond.

The Accident

At milepost 58.1, the train was being operated at a speed of 48 mph, with no brakes applied, approaching the accident area. At the time the accident occurred, the train was being operated at 48 mph. The speed was recorded by the locomotive event recorder on the controlling locomotive. The maximum authorized speed for freight trains is 50 mph, as indicated in the current BNSF Powder River Division Timetable No. 6.

At milepost 63.3, the train crew members commented to each other when they felt a very large bump, then seconds later a train line induced emergency brake application occurred. The engineer reduced the throttle setting and the train came to a stop. He immediately called the Orin Line Dispatcher, informed him that the train had derailed, and that the wreckage might obstruct the other main line tracks. Examination of the train disclosed 29 cars, the 63rd through the 91st, had derailed, fouling all three main tracks.

Emergency responders from the Converse County Sheriffs Department, the Converse County Fire Department, and the BNSF Hazmat Team responded. There was no hazardous materials released, no evacuation, and no injury.

Analysis

Inspection of the data printout from the leading locomotive event recorder disclosed no unusual events related to train handling.

Investigation revealed that the four hole joint of a rail joint at the point of derailment had developed a crack extending from the outermost bolt hole which ran 11 inches to a field weld and then upward through the heat transfer area of the field weld and on through the ball of the rail.

This rail was last tested ultrasonically for internal rail defects on April 14, 2005, by Herzog Services, Inc. Test Car No. HRZ117. A rail defect was noted at the point of derailment. On that date the carrier installed a temporary repair which consisted of a replacement rail with 6 hole joint bars. The outermost holes were not drilled in the rail for the temporary repair. No record indicated when the rail was permanently field welded.

FRA has recommended prosecution of BNSF for civil penalties for failure to comply with Continuous Welded Rail (CWR) procedures: not noting required information on the web of the rail as required.

The BNSF track inspector had inspected this area on May 12, 2005, and noted no defects in the derailment area.

Sections of the broken rail were sent to the BNSF laboratory at Topeka, Kansas, for analysis. Results of that analysis have not yet been received.

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

Conclusion

A break in the rail at a rail joint at the point of derailment ran 11 inches from a bolt hole to a field weld and then broke upward through the ball of the rail. The break allowed a portion of the rail to dislodge and caused the wheels of the 63rd head car in the train to derail.

Probable Cause

The probable cause of the accident was a broken rail - a bolt hole crack or break in the outermost bolt hole of a rail joint that ran to a field weld and then broke through the ball of the rail.