



***Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-85***

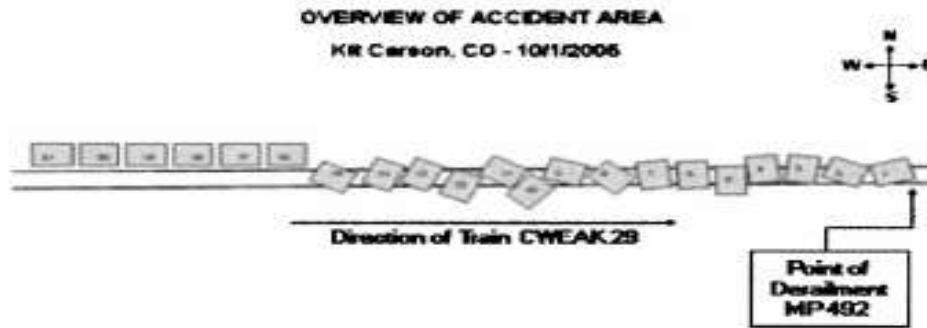
***Union Pacific (UP)
Kit Carson, Colorado
October 1, 2005***

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 # <u>HQ-2005-85</u>	
1. Name of Railroad Operating Train #1 Union Pacific RR Co. [UP]				1a. Alphabetic Code UP		1b. Railroad Accident/Incident No. 1005DV001	
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. 1005DV001	
4. U.S. DOT_AAR Grade Crossing Identification Number				5. Date of Accident/Incident Month Day Year 10 01 2005		6. Time of Accident/Incident 02:05: <input type="checkbox"/> AM <input checked="" 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	
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	
						13. Other (describe in narrative) 01	
8. Cars Carrying HAZMAT 0		9. HAZMAT Cars Damaged/Derailed 0		10. Cars Releasing HAZMAT 0		11. People Evacuated 0	
						12. Division Denver	
13. Nearest City/Town Kit Carson				14. Milepost (to nearest tenth) 492.0		15. State Abbr Code N/A CO	
16. County CHEYENNE							
17. Temperature (F) (specify if minus) 90 F		18. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 2		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 Single Main				22. FRA Track Code Class (1-9, X) 3		23. Annual Track Density (gross tons in millions) 23	
						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 A. Spec. MoW Equip. Code		26. Was Equipment Attended? Code		27. Train Number/Symbol	
2. Passenger train 5. Single car 8. Light loco(s).		3. Commuter train 6. Cut of cars 9. Maint./inspect.car		1. Yes 2. No 1		CWEAK29	
28. Speed (recorded speed, if available) Code R - Recorded 39 MPH R E - Estimated		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 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 0	
29. Trailing Tons (gross tonnage, excluding power units) 14817							
31. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded (yes/no)	
(1) First involved (derailed, struck, etc)		N/A		66		yes	
(2) Causing (if mechanical cause reported)		0		0		N/A	
						32. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	
						Alcohol 0 Drugs 0	
						33. Was this consist transporting passengers? (Y/N) N	
34. Locomotive Units		a. Head End		b. Mid Train		c. Rear End	
		b. Manual		c. Remote		d. Manual c. Remote	
(1) Total in Train 2		0		0		1	
(2) Total Derailed 0		0		0		0	
35. Cars		a. Freight		b. Pass.		c. Freight d. Pass. e. Caboose	
(1) Total in Equipment Consist 104		0		0		0	
(2) Total Derailed 21		0		0		0	
36. Equipment Damage This Consist 1487141		37. Track, Signal, Way, & Structure Damage 60855		38. Primary Cause Code T207		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 7 Mi 35		45. Conductor Hrs 7 Mi 35					
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 2		50. Was EOT Device Properly Armed? 1. Yes 2. No N/A		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 A. Spec. MoW Equip. Code		53. Was Equipment Attended? Code		54. Train Number/Symbol	
2. Passenger train 5. Single car 8. Light loco(s).		3. Commuter train 6. Cut of cars 9. Maint./inspect.car		1. Yes 2. No N/A		N/A	
55. Speed (recorded speed, if available) Code R - Recorded 0 MPH N/A E - Estimated		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	

DEPARTMENT OF TRANSPORTATION FEDERAL RAILROAD ADMINISTRATION		FRA FACTUAL RAILROAD ACCIDENT REPORT				FRA File # <u>HQ-2005-85</u>																									
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)		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)		59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.																							
(1) First involved (derailed, struck, etc)		0		N/A		N/A						Alcohol N/A		Drugs 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 c. Remote		Rear End d. Manual c. Remote		62. Cars		Loaded a. Freight b. Pass.		Empty c. Freight d. Pass.		e. Caboose																	
(1) Total in Train		0		0 0		0 0		(1) Total in Equipment Consist		0 0		0 0		0 0																	
(2) Total Derailed		0		0 0		0 0		(2) Total Derailed		0 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								Length of Time on Duty																							
67. Engineer/Operators		N/A		68. Firemen		N/A		69. Conductors		N/A		70. Brakemen		N/A																	
Casualties to:		73. Railroad Employees		74. Train Passengers		75. Other		71. Engineer/Operator		Hrs 0 Mi 0		72. Conductor		Hrs 0 Mi 0																	
Fatal		0		0		0		76. EOT Device?		1. Yes 2. No N/A		77. Was EOT Device Properly Armed?		1. Yes 2. No N/A																	
Nonfatal		0		0		0		78. Caboose Occupied by Crew?		1. Yes 2. No				N/A																	
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)								83. Equipment 3. Train (standing) 6. Light Loco(s) (moving) 1. Train(units pulling) 4. Car(s)(moving) 7. Light(s) (standing) 2. Train(units pushing) 5. Car(s)(standing) 8. Other (specify in narrative)																							
80. Vehicle Speed (est. MPH at impact)								84. Position of Car Unit in Train																							
N/A								N/A																							
82. Position 1. Stalled on Crossing 2. Stopped on Crossing 3. Moving Over Crossing 4. Trapped								85. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User																							
Code N/A								Code N/A																							
86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?								86b. Was there a hazardous materials release by																							
1. Highway User 2. Rail Equipment 3. Both 4. Neither								1. Highway User 2. Rail Equipment 3. Both 4. Neither																							
Code N/A								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		4. Wig Wags		7. Crossbucks		10. Flagged by crew		88. Signaled Crossing Warning (See instructions for codes)		Code		89. Whistle Ban		Code															
2. Cantilever FLS		5. Hwy. traffic signals		8. Stop signs		11. Other (spec. in narr.)								1. Yes																	
3. Standard FLS		6. Audible		9. Watchman		12. None								2. No																	
Code(s)		N/A		N/A		N/A		N/A		N/A		N/A		3. Unknown		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								1. Yes								1. Yes															
2. Side of Vehicle Approach								2. No								2. No															
3. Opposite Side of Vehicle Approach				N/A				3. Unknown				N/A				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		97. Driver Passed Standing Highway Vehicle		Code															
0		1. Male		N/A		1. Yes 2. No 3. Unknown		N/A		1. Drove around or thru the Gate		4. Stopped on Crossing		1. Yes 2. No 3. Unknown		N/A															
		2. Female								2. Stopped and then Proceeded		5. Other (specify in narrative)																			
										3. Did not Stop																					
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 3. Passing Train 5. Vegetation 7. Other (specify in narrative)				N/A																			
2. Standing Railroad Equipment 4. Topography 6. Highway Vehicle 8. Not obstructed																															
101. Casualties to Highway-Rail Crossing Users				Killed				Injured				99. Driver Was				Code															
				0				0				1. Killed 2. Injured 3. Uninjured				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.
85.bmp



Car Numbers:

- | | |
|----------------|----------------|
| 1. CMO 504070 | 11. CMO 504008 |
| 2. CMO 504075 | 12. CMO 504007 |
| 3. CMO 504077 | 13. CMO 504006 |
| 4. CMO 504076 | 14. CMO 504005 |
| 5. CMO 504082 | 15. CMO 504010 |
| 6. CMO 504081 | 16. CMO 504009 |
| 7. CMO 504080 | 17. CMO 504014 |
| 8. CMO 504033 | 18. CMO 504013 |
| 9. CMO 504032 | 19. CMO 504012 |
| 10. CMO 504019 | 20. CMO 504011 |
| | 21. CMO 504018 |

109. SYNOPSIS OF THE ACCIDENT

On October 1, 2005, at approximately 2:05 p.m. Mountain Daylight Time (MDT), an eastbound UP loaded coal Train Symbol CWEAK-29, traveling at a recorded speed of 39 mph, derailed its 66th through 86th head cars (21 cars), and damaged 624 feet of the single main track. There were no hazardous materials involved in this accident. Also, there were no reportable injuries to the crew.

This accident occurred on the UP's Denver Service Unit, Limon Subdivision, at milepost (MP) 492.0, in the city of Kit Carson, Colorado. Through the subject area, the UP operates east and west over a single main track by Track Warrant Control (TWC) authority. This TWC extends from Sharon Springs, Kansas, MP 429.9, westward to Railroad Station Pullman, MP 637.6, at Denver, Colorado, a distance of 207.7 miles. The TWC authority to operate over this subdivision is issued by UP dispatchers located in the Harriman Dispatching Center in Omaha, Nebraska.

As a result of the accident, the total monetary damage was \$1,487,141 to the derailed cars, and \$60,855 to the track structure. In addition, the main track was blocked for approximately 18 hours and 15 minutes before normal service resumed.

At the time of the accident, the temperature was 90 °F. Visibility was clear during the daylight hours, with no wind.

The investigation suggests the probable cause of the derailment was a broken rail due to a detail fracture defect.

110. NARRATIVE

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

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On October 1, 2005, after having the required time off duty of more than 10 hours, the crew of Train Symbol CWEAK-29, consisting of an engineer and a conductor, reported for duty at the North Yard office, their home terminal, in Denver, Colorado, at the appointed time of 6:15 a.m. MDT. They were to operate the train to their away-from-home terminal at Sharon Springs, Kansas. Their train departed North Yard at 7:25 a.m., and proceeded east.

Their assigned loaded coal train consisted of 3 locomotives, Locomotive Nos. UP 6062 and UP 6883 at the head-end and UP 6469 at the rear-end, and 104 loads of coal with a total length of 5,526 feet and 14,872 trailing tons.

At the time of the accident, the engineer was seated in the control seat on the south (right) side at the controls of the lead locomotive, while the conductor was seated on the north (left) side.

The railroad trackage at MP 492.0 is oriented, geographically and by timetable, east and west. The track is practically level and tangent through the area of the accident. In the area of the derailment, the track consists of second-hand 133-lb. jointed rails, rolled in 1955. The UP signal system showed that prior to the accident, the subject train passed two hot box detectors at MP 507.1 and MP 525. 0. The tapes of these detectors showed no defects.

Two weeks before the accident, a geometry car inspected the involved trackage, with no exceptions noted. Through this area, the timetable maximum authorized speed is 49 mph for freight trains only. There is an average of eight freight trains per day.

THE ACCIDENT

The train crew stated that after coming off a 25-mph slow order between MP 494.0 and MP 494.75, they were given Track Warrant No. 4566. They powered up the train and proceeded eastward. At about 1:50 p.m., the crew felt a sudden deceleration and experienced an emergency air brake application to their train at MP 492.0. Recorded speed at this time was 39 mph.

As the train came to a stop, the conductor looked back on the north side of the train and could see a cloud of dust and derailed cars. The conductor asked the engineer to contact the dispatcher and notify him of the derailment. He then walked back and inspected the derailed cars. He discovered the first derailed car was about 60 cars from the head of the train.

According to the train crew, the Cheyenne County Sheriff arrived shortly, thereafter. Due to a long distance, the Denver Divisional personnel did not arrive until 5:45 p.m. Upon arrival, they immediately initiated an investigation.

After being interviewed, the train crew was transported back to North Yard office in Denver, where they had an alcohol and urine analysis under Company Reasonable Cause testing. They were released at approximately 11:30 p.m.

ANALYSIS AND CONCLUSIONS

The UP records showed that an engineer conducted a 1000-mile terminal train air brake test on September 30, 2005, in Grand Junction, Colorado. According to the involved train crew, the trip was normal and uneventful to the point of the accident.

On October 5, 2005, UP sent a section of the broken rail to Rail Sciences Inc., in Omaha for lab analysis. The lab result completed on October 6, indicated the rail was horizontally bent. Inspection of the fracture surface morphology suggested that the fracture origin was in the base, on the outside of the bend. It was also determined the plastic deformation on the head of the rail was not caused by wheel batter, but is the result of striking something after the derailment. The lab analyst determined that the fracture of this rail section was all overload and broke as a result of the derailment. This particular fracture was not the cause of the derailment.

The Manager of Operating Practices (MOP) was in charge of FRA mandatory post-accident toxicological testing. They hired him on the UP in 1993 and promoted him to MOP on March 1, 2005. On May 23, 2005, he attended a 4-hour FRA Drug and Alcohol Supervisory video training. The MOP admitted his lack of experience was the reason that he failed to recognize the damage would exceed \$1 million. Therefore, he did not conduct the testing as required under Title 49 Code of Federal Regulations (CFR) Part 219, Subpart C (Post-Accident Toxicological Testing). He added that he had thought the damage to each of the rail cars would have been about \$25,000. This would have resulted in the whole accident cost being about \$600,000. In actuality, the rail cars were worth about \$60,000, resulting in about \$1.5 million estimated damage. He indicated that he would seek assistance from more experienced supervisors in the future to prevent this unexpected situation from happening again.

The investigation revealed the railroad performed the testing under Title 49 Code of Federal Regulations (CFR) Part 219, Subpart D (Testing for Cause) on the involved train crew. The results of testing were negative.

I took no exceptions during the course of investigation.

PROBABLE CAUSE AND CONTRIBUTING FACTOR

The rail fracture sent to the lab for testing determined that this fracture did not cause the derailment. However, the available evidence suggests the probable cause of the derailment was a broken rail due to detail fracture (T207). The FRA concurs with the probable cause.