Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-46

Union Pacific Railroad Co. (UP)
Gypsum, CO
October 7, 2009

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-2009-46

1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP]	1a. Alphabetic Code: UP	1b. Railroad Accident/Incident No.: 1009DV005
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident No.: N/A
3.Name of Railroad Operating Train #3: N/A	3a. Alphabetic Code: N/A	3b. Railroad Accident/Incident No.: N/A
4.Name of Railroad Responsible for Track Maintenance: Union Pacific RR Co. [UP]	4a. Alphabetic Code: UP	4b. Railroad Accident/Incident No.: 1009DV005
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 10 | Day 07 | Year 2009	7. Time of Accident/Incident: 09:00: ☐ AM ☑ PM

8. 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)* — Code: 01

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
3	1	0	0	Denver SU

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Gypsum	342.0	N/A	CO	EAGLE

18. Temperature (F) *(specify if minus)*	19. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
27 F	4	2	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density *(gross tons in millions)*	25. Time Table Direction 1. North 2. South 3. East 4. West — Code
Main Track	3	36.9	4

OPERATING TRAIN #1

26. 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	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
1	1	MNYRO07

29. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	31. Method(s) of Operation *(enter code(s) that apply)*	31a. Remotely Controlled Locomotive?
37 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)*	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter — 0

30. Trailing Tons *(gross tonnage, excluding power units)*: 8311

Code(s): e | N/A | N/A | N/A | N/A

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	UP219130	6	yes
(2) Causing *(if mechanical cause reported)*	0	0	N/A

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
0	1

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

35. 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	1
(2) Total Derailed	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	48	0	55	0	0
(2) Total Derailed	27	0	3	0	0

37. Equipment Damage — This Consist: $1,576,094.00

38. Track, Signal, Way, & Structure Damage: $453,134.00

39. Primary Cause Code: H019

40. Contributing Cause Code: N/A

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	0

Length of Time on Duty

45. Engineer/Operator: Hrs 2 Mi 40

46. Conductor: Hrs 2 Mi 40

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	0

50. EOT Device? 1. Yes 2. No — 1

51. Was EOT Device Properly Armed? 1. Yes 2. No — 1

52. Caboose Occupied by Crew? 1. Yes 2. No — N/A

OPERATING TRAIN #2

53. 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	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

56. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	58. Method(s) of Operation *(enter code(s) that apply)*	58a. Remotely Controlled Locomotive?
N/A 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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57. 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

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

60. 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

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

62. 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	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

64. Equipment Damage This Consist N/A

65. Track, Signal, Way, & Structure Damage N/A

66. Primary Cause Code N/A

67. Contributing Cause Code N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

72. Engineer/Operator Hrs N/A Mi N/A

73. Conductor Hrs N/A Mi N/A

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

77. EOT Device? 1. Yes 2. No N/A

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

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

OPERATING TRAIN #3

80. 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

81. Was Equipment Attended? 1. Yes 2. No Code N/A

82. Train Number/Symbol N/A

83. Speed *(recorded speed, if available)* Code
R - Recorded
E - Estimated N/A MPH N/A

84. Trailing Tons *(gross tonnage, excluding power units)* N/A

85. 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) N/A N/A N/A N/A N/A

85a. 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 N/A

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

87. 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

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

89. 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	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

91. Equipment Damage This Consist N/A

92. Track, Signal, Way, & Structure Damage N/A

93. Primary Cause Code N/A

94. Contributing Cause Code N/A

Number of Crew Members

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

99. Engineer/Operator Hrs N/A Mi N/A

100. Conductor Hrs N/A Mi N/A

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

104. EOT 1. Yes 2. No N/A

105. Was EOT Device Properly 1. Yes 2. No N/A

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

Highway User Involved

107. 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

108. Vehicle Speed *(est. MPH at impact)* N/A

109. *geographical)* 1.North 2.South 3.East 4.West Code N/A

Rail Equipment Involved

111. 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

112. Position of Car Unit in N/A

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110. Position 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	Code N/A
114a. 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	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A
114c. State here the name and quantity of the hazardous materials released, if any. N/A			

115. Type 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	116. Signaled Crossing *(See instructions for codes)*	Code	117. Whistle Ban 1. Yes 2. No 3. Unknown	Code
Code(s) N/A N/A N/A N/A N/A N/A N/A		N/A		N/A

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code N/A	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code N/A	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code N/A

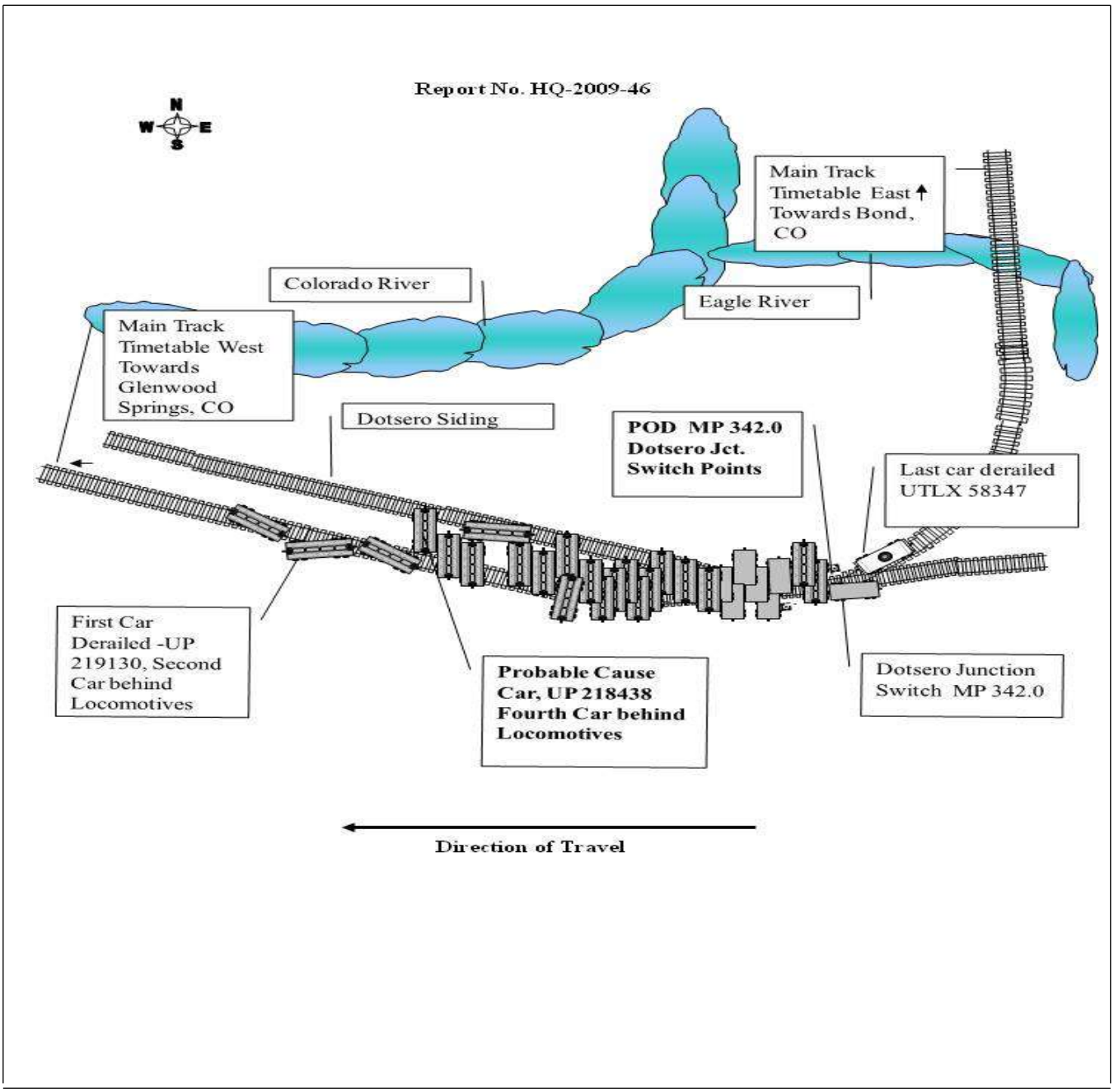
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)*	Code N/A

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code N/A	126. 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

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code N/A	128. Was Driver in the Vehicle? 1. Yes 2. No	Code N/A
129. Highway-Rail Crossing Users	N/A	N/A	130. Highway Vehicle Property Damage *(est. dollar damage)*	N/A	131. Total Number of Highway-Rail Crossing Users *(include driver)*	N/A

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code N/A	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code N/A	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code N/A

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



137. SYNOPSIS OF THE ACCIDENT

Westbound Union Pacific Railway Company (UP) freight Train Symbol MNYRO-07 derailed 30 cars at milepost (MP) 342.0 (6 miles from the closest town, Gypsum, Colorado) on the Glenwood Springs Subdivision (of the Denver Area Timetable No. 3) at 9 p.m., MDT, on October 7, 2009. The train consisted of 103 cars and had gone by three (3) hot box detectors in the 38 miles it had traveled from Bond, Colorado (MP 128.8) to Dotsero Station (MP 166/MP 342 equation change) without notification of a hot journal. Hazardous materials (Hazmat) cars were in the mixed freight train, but there was no hazmat release. There were no casualties. The total estimated cost of the derailment was $2,029,228.

At the time of the derailment, it was dark and cloudy. The temperature was 27 °F.

The Federal Railroad Administration's (FRA) investigation determined that the probable cause of the derailment was H019, Failure to release hand brake on car(s) (railroad employee).

138. NARRATIVE

Circumstances Prior to the Accident

The crew of UP Train Symbol MNYRO-07 included a locomotive engineer and a conductor. They went on duty at 6:20 p.m., MDT, October 7, 2009, at the UP station at Bond. Both crewmen had received the required statutory off-duty period prior to reporting for duty.

Their assigned freight train at the time of the derailment consisted of 4 locomotives on the head end and 1 locomotive on the rear of the train, 48 loaded cars, and 55 empty cars of several varieties. It was 5,680 feet long and weighed 8,311 tons. The train had received a Class 1 Air Brake Test and Inspection at North Yard in Denver on October 7, 2009. The train was a road train and had been secured at Bond by the inbound crew. The train was given a set and release of the air brake system after the conductor said he released six handbrakes on the cars, and the engineer said he released four handbrakes on the locomotives.

The train proceeded west (timetable direction) and went by hot box detectors at MPs 136.7, 148.4, and 157.2, and all gave a "no defect" message, according to the conductor's report (Signal Awareness Form). The train was going by a high/wide detector at MP 166.3 at the junction switch at approximately 9 p.m., with the engineer seated at the controls on the north (geographically) side of the leading locomotive. The conductor was seated in the front seat on the south side of the lead locomotive when they experienced an undesired release of the train's air brake system.

The track is tangent with a ascending grade at the junction switch of 0.5-percent. The railroad timetable direction of the train is west. Timetable directions are used throughout this report.

The Derailment

The train speed at the time of the derailment was 37 mph, as recorded by the event recorder on Locomotive No. UP 5953. The timetable (Glenwood Springs Subdivision, effective 0001 Sunday, November 12, 2006)

indicates the maximum speed in this area is 35 mph.
As UP Train Symbol MNYRO-07 was pasing over the junction switch at Dotsero Station, the train experienced an emergency application of the air brake system and came to a stop, after destroying 1,200 feet of main track and 200 feet of the Dotsero Siding track. All signals in the area were also destroyed. Thirty cars were derailed, starting with the second car behind the fourth locomotive. The conductor walked back from the lead locomotive to make this determination and notified the engineer who contacted the train dispatcher by train radio. UP managers were in the vicinity and arrived on the scene. Hazmat cars were not compromised. Clean-up crews came later to start clearing the cars and debris, and railroad track crews began replacing rail.

Analysis and Conclusions

Analysis -Toxicological Testing: FRA post-accident toxicological testing was conducted on both the locomotive engineer and conductor. The results were negative for the locomotive engineer and reported a positive result for marijuana in both urine and blood for the conductor.

Conclusion: Although the conductor's test was reported as positive for marijuana, due to the concentrations found, it cannot be determined whether his use of the drug impacted his performance or judgment at the time of the accident.

Analysis- Fatigue Analysis Scheduling Tool (FAST): FRA obtained fatigue-related information for the 10-day period preceding this accident/incident, including the 10-day work history (on-duty/off-duty cycles) for all of the employees involved.

Conclusion: FRA concluded that fatigue was not probable for either the conductor or the locomotive engineer.

Analysis - Locomotive Engineer Operating Performance: The event recorder from the lead Locomotive No. UP 5953, was reviewed for train handling. Efficiency test records were reviewed for the 6 months prior to the derailment. Training records were also examined. The engineer was also interviewed regarding his actions leading to the derailment.

Conclusion: The event recorder showed the speed of the train at 37 mph at the point of derailment (MP 342). Maximum timetable speed is 35 mph approaching MP 342 from the east. After MP 342, the maximum timetable speed increases to 60 mph. The efficiency test records indicated 9 testing sessions in the last 6 months on the locomotive engineer with 43 passed tests and 0 failures on rules. The engineers most recent training on the operating rules was on April 2, 2009. The locomotive engineer was in compliance with all applicable railroad and train handling requirements.

Analysis -Conductor Operating Performance: The Signal Awareness Form as filled out by the conductor was reviewed, showing detector and signal indications. In addition the conductor’s efficiency test, records were reviewed for the 3 months prior to the derailment. Training records were also examined. The conductor was also interviewed regarding his actions leading to the derailment.

Conclusion: The conductor was efficiency tested 2 times in 6 months; once in August, once in September. There were 0 failures on 13 rules. The conductor’s most recent training on the operating rules was on August 13, 2009. The conductor stated during his interview that he released handbrakes on the first 6 cars of the train prior to departing Bond. The investigation by the UP showed that the handbrake was still applied on the fourth car in the train, Car No. UP 218438. This indicated the conductor failed to follow UP Air Brake and Train Handling Rule, 32.2: Releasing Handbrakes. In addition, UP determined that the conductor also failed to comply with General Code of Operating Rule 6.29.2: Train Inspections by Crew Members.

Analysis -Track: UP track inspection records were reviewed for October 2009. The track had been inspected on October 6, 2009, by UP track personnel. The FRA detection car had been over the Glenwood Springs Subdivision on August 14, 2009. The track had been inspected on September 25, 2009, with the FRA DOTX 219, according to the local FRA track inspector. An alignment defect was identified just east of the estimated point of derailment. The defect amounted to a one class drop, and was repaired by railroad employees on September 25, 2009. According to the FRA track inspector, the last rail detector car tested over this section of track on August 14, 2009. No defects were found at the time.

Conclusion: The track was in relatively good condition. There were no slow orders in effect at the location of the derailment. Repairs had been made to the defects found by the FRA detection car the day they were found. No defects were found by UP personnel on October 6, 2009. Track conditions are not considered a factor in this derailment.

Analysis - Mechanical: The train was inspected by UP mechanical personnel after the derailment. The fourth car in the train was found to have a handbrake applied. One axle was found with a 10-inch long and 1-inch deep flat spot on both wheels of the No. 1 axle on the trailing truck of UP Car No. 218438. In addition, mechanical history records of the UP Car No. 218438, the first car derailed, were also reviewed for 1 year prior to the derailment.

Conclusion: The fourth car, UP Car No. 218438 with a handbrake applied and resulting flat spot, appears to have caused the derailment. The photo taken by UP personnel at the scene of the derailment shows the handbrake applied.

Overall Conclusions: There did not appear to be any track defects as the train approached the derailment site. Based on the event recorder download, the locomotive engineer was in compliance with all applicable railroad and train handling requirements. FRA post-accident testing indicated that the conductor was positive for marijuana in both urine and blood. Due to the concentrations found, it cannot be determined whether his use of the drug impacted his performance or judgment at the time of the accident.

UP Car No. 218438 with a flat wheel caused the derailment. This was due to the failure of the conductor to release the hand brake. The derailment was a result of H019, Failure to release hand brake on UP Car No. 218438.

Probable Cause and Contributing Factors

The FRA's investigation determined that the probable cause of the derailment was H019, Failure to release hand brake on car(s) (railroad employee).