Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-40

Union Pacific (UP)
Tama, Iowa
June 26, 2007

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-2007-40

1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP]	1a. Alphabetic Code: UP	1b. Railroad Accident/Incident No.: 0607CB011
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.: 0607CB011
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 06 | Day 26 | Year 2007	7. Time of Accident/Incident: 03:00: ☐ AM ☑ PM

8. Type of Accident/Indicent (single entry in code box)						Code
1. Derailment	4. Side collision	7. Hwy-rail crossing	10. Explosion-detonation	13. Other (describe in narrative)		01
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			

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
8	0	0	0	Council Bluffs

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Tama	134.75	N/A	IA	TAMA

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
89 F		2		1		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.	Code
Main Track No 1		5	127.18		3

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. Yes	1	2CATKI24

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?
26 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): 19734

Code(s): b | h | 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)	COMX9128	69	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	1	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	138	0	0	0	0
(2) Total Derailed	41	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
780529	120670	T108	H699

Number of Crew Members				Length of Time on Duty	
41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen	45. Engineer/Operator	46. Conductor
1	1	1	0	Hrs 5 Mi 15	Hrs 5 Mi 15

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
	1	1. Yes	1	KG2TS25

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?
21 MPH	R	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): 6185

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): b | h | N/A | N/A | N/A

2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter: 0

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	UP4231	1	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A

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

Alcohol	Drugs
0	0

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

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	3	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	94	0	0	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: 12000

65. Track, Signal, Way, & Structure Damage: 0

66. Primary Cause Code: T108

67. Contributing Cause Code: H699

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
1	0	2	0

Length of Time on Duty

72. Engineer/Operator: Hrs 4 Mi 55

73. Conductor: Hrs 4 Mi 55

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

77. EOT Device? 1. Yes 2. No: 1

78. Was EOT Device Properly Armed? 1. Yes 2. No: 1

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	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A	1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	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	N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	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
Code(s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A					

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

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

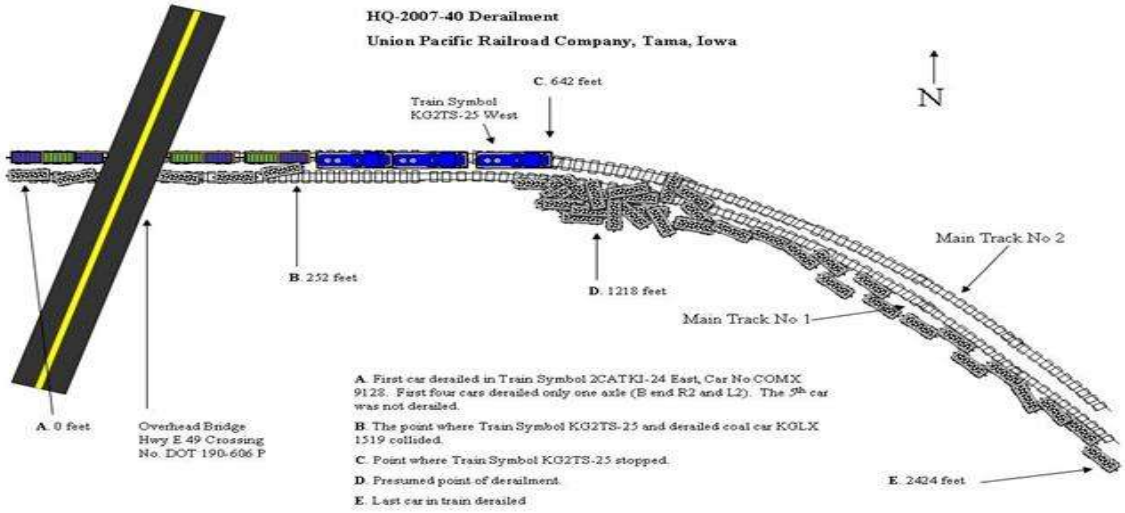
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)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

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

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				N/A		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	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code
	N/A		N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code
	N/A		N/A

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



137. SYNOPSIS OF THE ACCIDENT

On June 26, 2007, at 3 p.m. C.D.T., an eastbound Union Pacific Railroad Company (UP) loaded coal train, identified as Train Symbol 2CATKI-24, here and after noted as Train No. 1, operating at a recorded speed of 26 mph derailed 41 cars of its 138-car train (cars 67 through 108 from the head-end). The derailment occurred in Tama County, approximately 1 3/4 miles west of Tama, Iowa. It occurred on the UP's Council Bluffs Service Unit, Clinton Subdivision at milepost (MP) 134.75, Main Track No 1. The derailed equipment of Train No. 1 struck an adjacent, passing, westbound, intermodal train, identified as Train Symbol KG2TS-25, here and after noted as Train No. 2, operating at a recorded speed of 21 mph on Main Track No. 2. This collision did not result in any derailed equipment of Train No. 2 and its 3-man crew was uninjured. The fuel tanks on the locomotives of Train No. 2 were not compromised and no diesel fuel was released.

The estimated damage cost for track is $120,670 and $792.529 for equipment. The train crews of both trains were drug/alcohol tested.

At the time of the accident it was daylight and clear. The temperature was 89 degrees Fahrenheit.

The probable cause of the derailment was an alignment irregularity in the track, Cause Code T108. The area had a long history of alignment and surface problems. Resent heavy rains and subgrade saturation added to the instability of this area. A probable contributing factor was speed and train handling, Cause Code H699. The train passed over the point of derailment 6 mph faster then the posted speed. Shortly after the lead locomotives passed over the point of derailment, a request for dynamic braking was made. This excessive speed and train handling placed greater dynamic forces on an already unstable track structure.

138. NARRATIVE

Circumstances Prior to the Accident

Train No. 1

The crew of Train No. 1, consisting of a locomotive engineer, conductor and a fireman-in-training went on duty in Boone, Iowa, at 9:45 a.m., C.D.T., on June 26, 2007, after receiving their statutory off duty rest period. Boone is the home terminal for all three crew members.

Their assigned coal train consisted of two locomotives on the head end and one distributed power unit on the rear, along with 138 loaded cars of coal. Their train was 7,452 feet in length and weighed 19,734 tons. The train was scheduled to travel from Boone east to Clinton, Iowa, with no other work en route. The terminal train air brake test was performed prior to the crew boarding. The airbrake test slip was reviewed by the crew members prior to departing with no exceptions taken.

The crew of Train No. 1 reported that the trip between Boone and MP 135 was uneventful. As the eastbound train approached the accident area, the fireman-in-training was seated at the controls on the south side of the lead locomotive. The engineer was seated in the center of the lead locomotive and the conductor was seated across from the fireman-in-training on the north side of the locomotive cab.

The derailment occurred in a 1-degree left-hand curve with a 0.02 percent ascending grade to the east. The railroad timetable direction and geographic direction are the same at this location.

Train No. 2

The crew of Train No. 2, consisting of a locomotive engineer, conductor and a conductor-in-training, went on duty in Clinton, Iowa, at 10:05 a.m., C.D.T., on June 26, 2007, after receiving their statutory off-duty rest period. The home terminal for the engineer and conductor is Boone, the conductor-in-training works out of Clinton. Their assigned intermodal train consisted of three locomotives on the head end and 94 loaded cars. Their train was 5,897 feet in length and weighed 6,185 tons. Their duty schedule for the day was to operate their train from Clinton west to Boone, with no other work en route.

The crew of Train No. 2 reported the trip between Clinton and MP 134 was uneventful. As the westbound train approached the accident area, the locomotive engineer was seated at the controls on the north side of the leading locomotive. The conductor was seated across from the engineer on the south side of the locomotive cab in the rear seat and the conductor-in-training, in front of him in the front seat.

In the area where the train hit the derailed coal car, the track was tangent coming into a 1-degree curve with a descending grade of 0.02 percent to the west. The railroad timetable direction and geographic direction are the same at this location.

The Accident

Train No. 1

Train No. 1 was being operated at a speed of 31 mph on Main Track No. 1 approaching the derailment area. At the time the derailment occurred, the train was being operated at a speed of 26 mph. Both speeds were recorded by the event recorder of the second locomotive in the train, Locomotive No. UP 5797. The event recorder from Locomotive No. UP 5797 was used due to a bad speed trace on lead Locomotive No. UP 5895. The maximum operating speed for loaded coal trains in this area is 50 mph, as designated in the current UP, Iowa Area Timetable No. 2, which was made effective, December 12, 2003, but a temporary speed restriction of 25 mph was in place at this location.

The engineer and conductor of Train No. 1 stated as they passed over the location at MP 134.75 it felt rough but they both explained that it was always rough at that location. The fireman-in-training stated he did not see any abnormal track conditions or feel anything in the tracks up to the time of the derailment. The crew stated as they were passing a westbound intermodal train on Main Track No. 2 they experienced an undesired application of the train's airbrake system and heard over the radio, "There's cars everywhere, we're going to hit you, were going to hit you." They came to a stop at MP 133.87, they did not check their train and they did not leave the locomotive. They were told later that they had derail 41 cars of their train. The engineer and conductor explained they heard the dispatcher talking and chose to stay off the radio to cut down on radio congestion. They heard section forces working in the area responding to the derailment and felt it was best that they stay put. All crew members stated emphatically they were traveling at 25 mph through the entire slow order and at the time the derailment occurred.

There were no injuries to any person as a result of this derailment and no evacuation was necessary.

Train No. 2

Train No. 2 was being operated at a steadily increasing speed on Main Track No. 2 approaching the collision with the derailed coal car. At the point the engineer made an emergency application of the train's airbrake system, the train was being operated at 39 mph. At the point they made contact with the derailed coal car, they were operating at a speed of 21 mph. Both speeds were recorded by the event recorder of the second locomotive in the train, Locomotive No. UP 4313. The event recorder from Locomotive No. UP 4313 was used because the event recorder on Locomotive No. UP 4231, the lead locomotive, was badly damaged in the collision with the coal car. The maximum operating speed for loaded intermodal trains in this area is 70 mph, as designated in the current UP, Iowa Area Timetable No. 2, which was made effective, December 12, 2003.

The crew members stated as they were passing the eastbound coal train on Main Track No. 1, they saw it was creating a lot of dust. They then noticed the train was derailed and the engineer made an emergency application of the train's airbrake system. After colliding with the derailed coal car and the dust settled, the conductor and conductor-in-training exited through the engineer's door to inspect their train. They discovered that their train was not derailed.

There were no injuries to any person as a result of this collision and no evacuation was necessary. Train No. 2 had 12 cars designated as containing hazardous material. None of these cars were involved in or damaged by the collision with the coal car.

Analysis and Conclusion

Analysis

The last internal rail defect inspection of Main Track No. 1 was conducted on May 21, 2007. This test was performed by the UP's inspection Car No. DC23. No rail defects were noted in the area where the derailment occurred. At the time of the derailment, the UP was performing internal rail defect inspections on a cycle of approximately every 60 days.

The last geometry test vehicle inspection of Main Track No. 1 was conducted on April 3, 2007. This test was conducted by the UP's geometry test vehicle, Car No. EC5. A printout of exceptions noted during the inspection in the area of the derailment reveals numerous conditions of alignment, excessive crosslevel and twist in 31 feet. There were 36 conditions noted between MP 134.69 and MP 134.84. Of these 36 conditions, 12 were considered critical by UP definition and 22 were considered urgent. In this area, two locations were taken out of service by the UP until repairs could be made. These two out-of-service conditions were due to excessive crosslevel, a UP standard, not an FRA regulation. None of the 36 conditions noted on this printout for this inspection had reached the defective levels as set forth by the FRA's Track Safety Standards.

The last hi-rail visual track inspection was conducted on June 25, 2007. The inspection was made from Main Track No. 2, at approximately 11:30 a.m. The track inspector was interviewed and he explained that on this inspection he stopped and walked the area the derailment occurred on Main Track No. 1, but a train was stopped on top of the location and he could not conduct a thorough inspection. He did note that he could see no visible geometry irregularities at that time. The inspector also inspected this track on June 24, 2007, and actually traversed Main Track No. 1. On this inspection, he took crosslevel measurements in the area between MP 135 and MP 134.7. The worst surface condition he found at that time, was a difference in crosslevel in 62-feet that measured 1/4 inch. This warp condition measured from 4 1/2 inches of super elevation to 4 3/4 inches of super elevation in the curve, in 62-feet. This warp condition was located between MP 134.75 to MP 134.80 on Main Track No. 1 and did not reach the defective limits for surface as prescribed in Title 49 CFR Section 213.63. He noted the ballast was clean, and the cribs and shoulders were full of ballast. He stated there was a small amount of alignment at that time, but he determined it was well within standards and did not measure it. UP track inspection reports revealed the railroad was making daily inspections of this area which is well over the required frequence for inspection as set forth in Title 49 CFR Section 213.233.

A post-accident track inspection was conducted in the derailment area. When the train derailed it was in a 1-degree curve with from 3 to 5 inches of super elevation. From the initial pile-up of derailed coal cars, which contained approximately 13

cars, in the area of the presumed point of derailment, going west, a string of approximately 23 coal cars just laid over in a domino effect to the low side of the curve. This disturbed the original surface and line of the track and made it difficult to determine if any surfaces or line conditions existed prior to the derailment.

The area where the derailment occurred had a long history of having surface problems. A 60 mph slow order was placed in this area on April 4, 2007, for surface and line conditions. These conditions were found by the railroad's geometry Car No. EC5, on April 3, 2007. These conditions had not yet reached the defective levels for the class of track at which trains were being operated as set forth in the FRA's Track Safety Standards, Title 49 CFR Sections 213.63, 213.57 and 213.55, but a slow order was placed on the area anyway. Repairs were made and the slow order was lifted. On May 1, 2007, another 60 mph slow order was placed in the area for a surface condition and again was repaired. On June 6, 2007, a 25 mph slow order was placed in this area due to surface and line conditions. This condition was repaired and the speed raised to 40 mph. On June 15, 2007, again a 25 mph slow order was placed on the area and on the same day reduced to 10 mph due to an inspection conducted by the director of track maintenance and manager of track maintenance who felt the 10 mph slow order was necessary. Track work was performed and the speed was raised to 25 mph. On June 21, 2007, again a 10 mph slow order was placed in this area due to surface and line conditions; again remedial action was taken to bring the speed back to 25 mph. These final repairs were made on June 21, 2007, just 5 days before the derailment but the 10 mph slow order was not removed until June 23, 2007. This was done to allow trains to compact and stabilize the recently surfaced track. The repairs implemented at that time consisted of dumping ballast and surfacing with a surfacing gang, consisting of a tamper and regulator. The information on the 10 mph slow orders discussed above were provided by the UP. The spreadsheet provided indicate these 10 mph slow orders were 15 mph slow orders. The manager of track maintenance indicate that these 15 mph slow orders were entered into the database incorrectly and were indeed 10 mph slow orders.

Prior to the derailment, the railroad had called in the consulting firm of Shannon and Wilson, Inc., a geological specialist, to evaluate the area and determine why the surface would not hold. It was determined at this location the embankment had poor subsurface drainage and slopes generally too steep for the soils comprising the fill. In addition, water trapped in ballast pockets can flow into tension cracks and exert pressure on the unstable slope mass. Trench drains were to be installed to allow water to drain from this location and flatten the slope. These trench drains were scheduled to be installed on June 28, 2007, just two days after the derailment occurred.

The area where the derailment occurred is low lying and near the Iowa River. At the time of the derailment, the area was saturated with water. The ditches were full and the water was within 3 to 4 feet from the base of the rail on Main Track No. 1. The National Weather Service reported approximately 1.5 inches of rain fell on June 22, and approximately 3 inches fell on June 23.

An onboard camera in the lead locomotive of Train No. 1, Locomotive No. UP 5895, captured 2 small alignment irregularities in the track just prior to the derailment. In the pictures you can see the green release board for the slow order that was placed from MP 135 to MP 134.7. This green release board was located at MP 134.7, for eastbound moves. These alignment irregularities would have been located very near or at the presumed point of derailment at MP 134.75.

At the time the accident occurred, Train No. 1 was being operated at 26 mph. This speed was recorded by the event recorder on the second locomotive, Locomotive No. UP 5797. There was a 25 mph slow order from MP 135.0 to MP 134.7. When entering the slow order at MP 135, Train No. 1 was traveling at a recorded speed of 31 mph. When Locomotive No. UP 5797 passed over the eventual point of derailment (MP 134.75), it was traveling at a recorded speed of 31 mph. A request for dynamic braking was not made until MP 134.59. The locomotives remained in dynamic braking for 1 minute 11 seconds, after which time the train experienced an undesired emergency application of the train airbrake system at MP 134.0 and came to a stop at MP 133.87. Between MP 134.59 and 134.0, the most requested dynamic braking was 88 percent at MP 134.27 and was at 65 percent at the time of the undesired emergency application of the train's airbrake system. The railroad first indicated that this train-handling scenario was entered into a simulator for analysis. It was reported verbally that the simulation did not produce enough forces to cause the derailment. When asked for this simulation report at a later date, the railroad said no simulation had been done. It was explained that a quick unifacial simulation may have been done to get some idea of the forces involved but no formal report was created.

Based on the results of the Fatigue Avoidance Scheduling Tool (FAST) fatigue was not probable for any of the crew members of either train involved in this derailment.

The crew members of Train No. 1 and Train No. 2 were post-accident, toxicologically tested. At the time the derailment occurred, it was believed that this derailment would meet the FRA mandatory requirements for testing (accidents with $1 million in damages or more). It was later determined there was not as much equipment damage as first estimated and the total derailment cost only came to $913,199. The FRA Post-Accident Forensic Toxicology Results Report obtained from the FRA Alcohol and Drug Control Program Manager revealed one positive result. It was discovered that the fireman-in-training who was operating Train No.1 at the time of the derailment, had methamphetamine present in his blood and urine, and amphetamine was present in his urine. Based on the evidence available as of August 23, 2007, FRA cannot make a causal or contributing cause determination regarding the use of drugs. An adverse impact of methamphetamine in the covered employee's judgment and/or performance at the time of the accident can neither be ruled out, nor can it be affirmed. The amount of methamphetamine found in the employee's urine and blood are similar concentrations to those expected after someone has taken the drug therapeutically (after having it prescribed). As part of the Medical Review Officer Verification process it was found that the employee did have methamphetamine in his urine and blood but he did not produce a prescription for the use.

The investigation discovered no mechanical issues that would have caused or contributed to this derailment.

Conclusion

The railroad was in full compliance with their own, and all applicable Federal standards for track inspection. In the area the accident occurred, a subgrade problem existed. The railroad was required to repeatedly place slow orders on and make repairs to this area due to alignment and surface irregularities. The railroad's geological specialists determined that a pocket of water was trapped under the track at this location, and was the cause of its instability. This area had also received almost 5 inches of rain in the 5 days prior to the derailment and the ditches were full of water, adding to this subgrade saturation.

A 25 mph slow order was in place on Main Track No. 1 from MP 135 to MP 134.7. This slow order was placed on the track due to an unstable subgrade condition. The event recorder on the second locomotive of Train No. 1, Locomotive No. UP 5797, revealed that the train was traveling at a recorded speed of 31 mph at MP 135.0. When Locomotive No. UP 5797 passed over the eventual point of derailment (MP 134.75), it was traveling at a recorded speed of 31 mph. A request for dynamic braking was not made until MP 134.59. The locomotives remained in dynamic braking for 1 minute 11 seconds, after which time the train experienced an undesired emergency brake application at MP 134 and came to a stop at MP 133.87. Between MP 134.59 and 134.0, the most requested dynamic braking was 88 percent at MP 134.27 and was at 65 percent at the time of the undesired emergency application of the trains airbrake system. This excessive speed and train handling put greater dynamic forces on this already weakened track structure.

Based on the results of the Fatigue Avoidance Scheduling Tool (FAST) fatigue was not probable for any of the crew members of either train involved in this derailment.

Post-accident toxicology test revealed the operator of Train No. 1 had methamphetamine present in his blood and urine and amphetamine was present in his urine. FRA cannot make a causal or contributing cause determination regarding the use of drugs. An adverse impact of methamphetamine in the covered employee's judgment and/or performance at the time of the accident can neither be ruled out, nor can it be affirmed. The amount of methamphetamine found in the employee's urine and blood are similar concentrations to those expected after someone has taken the drug therapeutically (after having it prescribed).
The area had a long history of alignment and surface problems. Resent heavy rains and subgrade saturation added to the instability of this area. The train passed over the point of derailment 6 mph faster then the posted speed. Shortly after the lead locomotives passed over the point of derailment, a large request for dynamic braking was made. This excessive speed and train handling placed greater dynamic forces on an already unstable track structure.

Probable Cause

A probable contributing factor was speed and train handling, Cause Code H699.

The probable cause of the derailment, as determined by an FRA investigation, was an alignment irregularity in the track, Cause Code T108.