Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-99

Union Pacific (UP)
Riga, Kansas
November 4, 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 # HQ-2005-99

1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP]	1a. Alphabetic Code: UP	1b. Railroad Accident/Incident No.: 1105DV005
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.: 1105DV005
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident: Month 11 / Day 04 / Year 2005	6. Time of Accident/Incident: 10:07: ☐ 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	Denver

13. Nearest City/Town	14. Milepost (*to nearest tenth*)	15. State Abbr	15. State Code	16. County
Ogallah	311.6	N/A	KS	TREGO

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
43 F		4		1		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		4	23		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		CBRLMH01

28. Speed (*recorded speed, if available*) R - Recorded E - Estimated	Code
50 MPH	R

29. Trailing Tons (*gross tonnage, excluding power units*): 11350

30. 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)				
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

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (*yes/no*)
(1) First involved (*derailed, struck, etc*)	N/A	41	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	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	35. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	1	(1) Total in Equipment Consist	103	0	0	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	43	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
1990439	124233	T207	N/A

Number of Crew Members 40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
1	0	1	0

Length of Time on Duty 44. Engineer/Operator	45. Conductor
Hrs 3 Mi 37	Hrs 3 Mi 37

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 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	N/A		N/A

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

57. Method(s) of Operation (*enter code(s) that apply*): a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

57a. Remotely Controlled Locomotive? 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)*	N/A	N/A	N/A		N/A	N/A
(2) Causing *(if mechanical cause reported)*	N/A	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	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	N/A	N/A	N/A	N/A	N/A	(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	(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
N/A	N/A	N/A	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	71. Engineer/Operator Hrs N/A Mi N/A	72. Conductor Hrs N/A Mi N/A

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

76. EOT Device? 1. Yes 2. No	77. Was EOT Device Properly Armed? 1. Yes 2. No
N/A	N/A

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

Highway User Involved

79. Type — Code: N/A
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)*

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)* 3.Train *(standing)* 6.Light Loco(s) *(moving)*
2.Train *(units pushing)* 4.Car(s) *(moving)* 7.Light(s) *(standing)*
5.Car(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 — 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	N/A

88. Signaled Crossing Warning Code *(See instructions for codes)* N/A

89. Whistle Ban Code — 1. Yes 2. No 3. Unknown — N/A

90. Location of Warning Code — 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — N/A

91. Crossing Warning Interconnected with Highway Signals Code — 1. Yes 2. No 3. Unknown — N/A

92. Crossing Illuminated by Street Lights or Special Lights Code — 1. Yes 2. No 3. Unknown — N/A

93. Driver's Age: N/A

94. Driver's Gender Code — 1. Male 2. Female — N/A

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code — 1. Yes 2. No 3. Unknown — N/A

96. Driver Code — 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 — 1. Yes 2. No 3. Unknown — N/A

98. View of Track Obscured by *(primary obstruction)* Code — 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
	N/A	N/A

99. Driver Was Code — 1. Killed 2.Injured 3. Uninjured — N/A

100. Was Driver in the Vehicle? Code — 1. Yes 2. No — N/A

102. Highway Vehicle Property Damage *(est. dollar damage)* N/A

103. Total Number of Highway-Rail Crossing Users *(include driver)* N/A

104. Locomotive Auxiliary Lights? Code — 1. Yes 2. No — N/A

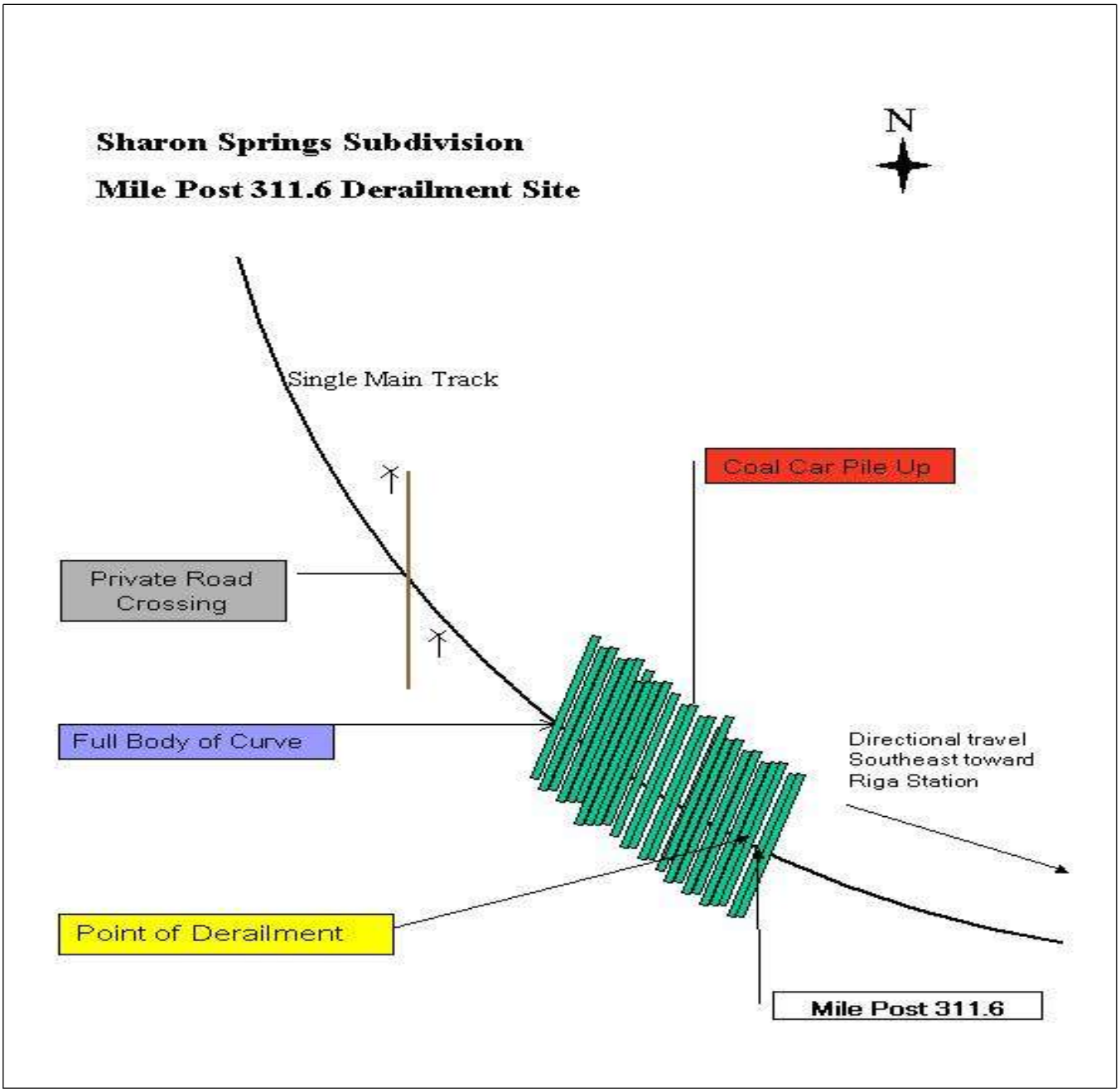
105. Locomotive Auxiliary Lights Operational? Code — 1. Yes 2. No — N/A

106. Locomotive Headlight Illuminated? Code — 1. Yes 2. No — N/A

107. Locomotive Audible Warning Sounded? Code — 1. Yes 2. No — N/A

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

HQ-2005-99 sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

An eastbound Union Pacific Railroad Company (UP) loaded coal train derailed on November 4, 2005, at 10:07 p.m.(CST). The derailment occurred at milepost (MP) 311.60, on the Sharon Springs Subdivision, 2 miles west of UP railroad station named Riga, and east of the City of Ogallah, Kansas.
The crew consisted of an engineer and a conductor. The derailment happened on single main track. Train Symbol CBRLMH01 consisted of 2 lead locomotives pulling 103 cars and a DPU unit trailing. Cars 39 through 81 derailed, totaling 43 cars. No injuries or hazardous materials were involved. Substantial damage was incurred to the track and mechanical equipment at an estimated cost of $2,114,672.
At the time of the accident, it was dark with clear skies and an estimated temperature of 43 °F.
The cause is a broken rail. Two sections of rail were sent for analysis to Rail Sciences, Inc., in Omaha, Nebraska.

110. NARRATIVE

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

Circumstances Prior to the Accident

The operating crew of the eastbound loaded coal train, Train Symbol CBRLMH-01, consisted of a locomotive engineer and a conductor. The crew had gone on duty at 5:30 p.m. (MST) on November 4, 2005, at Sharon Springs, Kansas. The crew members' home terminal is Salina, Kansas, and all had received more than the statutory off-duty period at their away-from-home terminal, prior to reporting for duty.
Their assigned freight train consisted of three locomotives, two on the head end and one DPU unit facing west. It consisted of 103 loads with a tonnage of 11,350 and a total length of 5,784 feet. The operating crew boarded, conducted an inspection of their train, and departed from Sharon Springs heading east, for the next crew change point in Salina. No air brake test was required. The last class one required air brake test was preformed by the car department personnel in Grand Junction, Colorado.
The engineer was sitting at the control panel monitoring the locomotives controls, while the conductor was in his seat reviewing the paperwork as they approached the accident site. The railroad timetable direction of the train was east. The geographic direction is southeast. Timetable directions and milepost locations are used throughout this report. As the eastbound coal train approached the accident area, the train crew reported that their trip had been uneventful and the consist was operating normally.
In the approaching area, and the area of the accident, the track has a 1-degree left-hand curve, making a transition into the full body of a 2-degree right-hand curve, which had an inch and a half of elevation. The grade starting at +1 descending to +0.45 into tangent track. The single main was made up of wood ties and a secondhand 132-lb standard strength continuous-welded rail (CWR) dated 1953 to 1957, laid in 1998.
The Accident
At the time of the accident, the train was traveling on single main track at a recorded speed of 50 mph. The maximum authorized speed on the main track through the derailment area is 50 mph in accordance with Salina Area Timetable No. 2, effective September 15, 2002.

At approximately 10 p.m. (CST), the train went into a train-induced undesired emergency stop. The train then traveled past the west switch at Riga siding coming to a stop. The crew reported to the dispatcher that the train had separated. The crew began shoving back until they reached the westbound signal at the west end of Riga siding. The crew then requested permission from the dispatcher to travel back past the west switch to find the rest of their train. Upon inspection, the conductor reported to the engineer that he thought there were approximately 41cars derailed accordion style.

Approximately 1,000 feet of wood panels were replaced on the single main track with an approximate cost of $124,233 and it was back in service by 1:30 p.m., November 6, 2005.

Analysis and Conclusions

The track had been inspected by a UP track inspector on November 4, 2005, with no defects reported. UP rail detector car DC28 conducted its last inspection before the derailment on August 25, 2005, and no defects were detected in the area of the derailment site. The last geometry car inspection was made on July 21, 2005, and no defects recorded.

The train crew was sent for post-accident toxicological testing. The Federal Railroad Administration (FRA) Post-Accident Forensic Toxicology Report indicated that the employees had negative test results. The event recorder indicates proper train handling and compliance with the operating rules.

Two suspected pieces of rail were removed from the point of derailment and sent for analysis to Rail Sciences Inc., in Omaha, Nebraska. One section of rail was determined to be the one which failed under the train. The secondhand standard strength 132-lb rail rolled in Illinois in 1957, failed due to detail initiated fatigue fractures, originating from head checking on the gage side of the rail. With the comparisons of the location of the undesirable stop and the location of derailed cars, all indications lead to the point of derailment having occurred in the full body of the curve where the rail was recovered. The evidence compiled in the rail analysis of the broken rail tested, agrees with the preliminary findings.

Probable Cause and Contributing Factors

Probable Cause was determined by the FRA to be, Cause Code T207 Broken Rail - Detail fracture from shelling or head check. This was confirmed by laboratory analysis completed at the Rail Sciences, Inc., in Omaha, Nebraska.