Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-07

Union Pacific (UP)
Plaquemines, LA
March 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-2009-7

1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP]	1a. Alphabetic Code: UP	1b. Railroad Accident/Incident No.: 0309LV007
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.	4a. Alphabetic Code: UP	4b. Railroad Accident/Incident No.: 0309LV007
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 03 | Day 07 | Year 2009	7. Time of Accident/Incident: 04:45: ☑ 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
20	5	1	100	Livonia Sub

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Plaquemines	85.5	N/A	LA	IBERVILLE

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
62 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
Single Main	2	30.7	2

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	LLL66 06

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?
16 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

30. Trailing Tons *(gross tonnage, excluding power units)*: 2285

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)*	GATX 40641	9	yes
(2) Causing *(if mechanical cause reported)*	GATX 40641	9	yes

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

Alcohol	Drugs
0	0

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	2	0	0	0	0
(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	7	0	50	0	0
(2) Total Derailed	1	0	4	0	0

37. Equipment Damage — This Consist: $114,163.00

38. Track, Signal, Way, & Structure Damage: $738,083.00

39. Primary Cause Code: E53C

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 10 Mi 45

46. Conductor: Hrs 10 Mi 45

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	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?
0 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

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2009-7

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)*	0	0	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
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	0	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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: $0.00

65. Track, Signal, Way, & Structure Damage: $0.00

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
0	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 0 Mi 0

73. Conductor: Hrs 0 Mi 0

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 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 0

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)*	0	0	N/A
(2) Causing *(if mechanical cause reported)*	0	0	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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

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

91. Equipment Damage This Consist: $0.00

92. Track, Signal, Way, & Structure Damage: $0.00

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
0	0	0	0

Length of Time on Duty

99. Engineer/Operator: Hrs 0 Mi 0

100. Conductor: Hrs 0 Mi 0

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	0	0	0
Nonfatal	0	0	0

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 0

110. Position	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A

113. Circumstance	Code
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?	Code
1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A

114b. Was there a hazardous materials release	Code
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	4.Wig Wags	7.Crossbucks	10.Flagged by crew
	2.Cantilever FLS	5.Hwy. traffic signals	8.Stop signs	11.Other *(spec. in narr.)*
	3.Standard FLS	6.Audible	9.Watchman	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
	N/A

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

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

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

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

121. Age	122. Driver's Gender	Code
0	1. Male 2. Female	N/A

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

124. 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

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

126. 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

Casualties to:	Killed	Injured
129. Highway-Rail Crossing Users	0	0

127. Driver	Code
1. Killed 2.Injured 3. Uninjured	N/A

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

130. Highway Vehicle Property Damage *(est. dollar damage)*
0

131. Total Number of Highway-Rail Crossing Users *(include driver)*
0

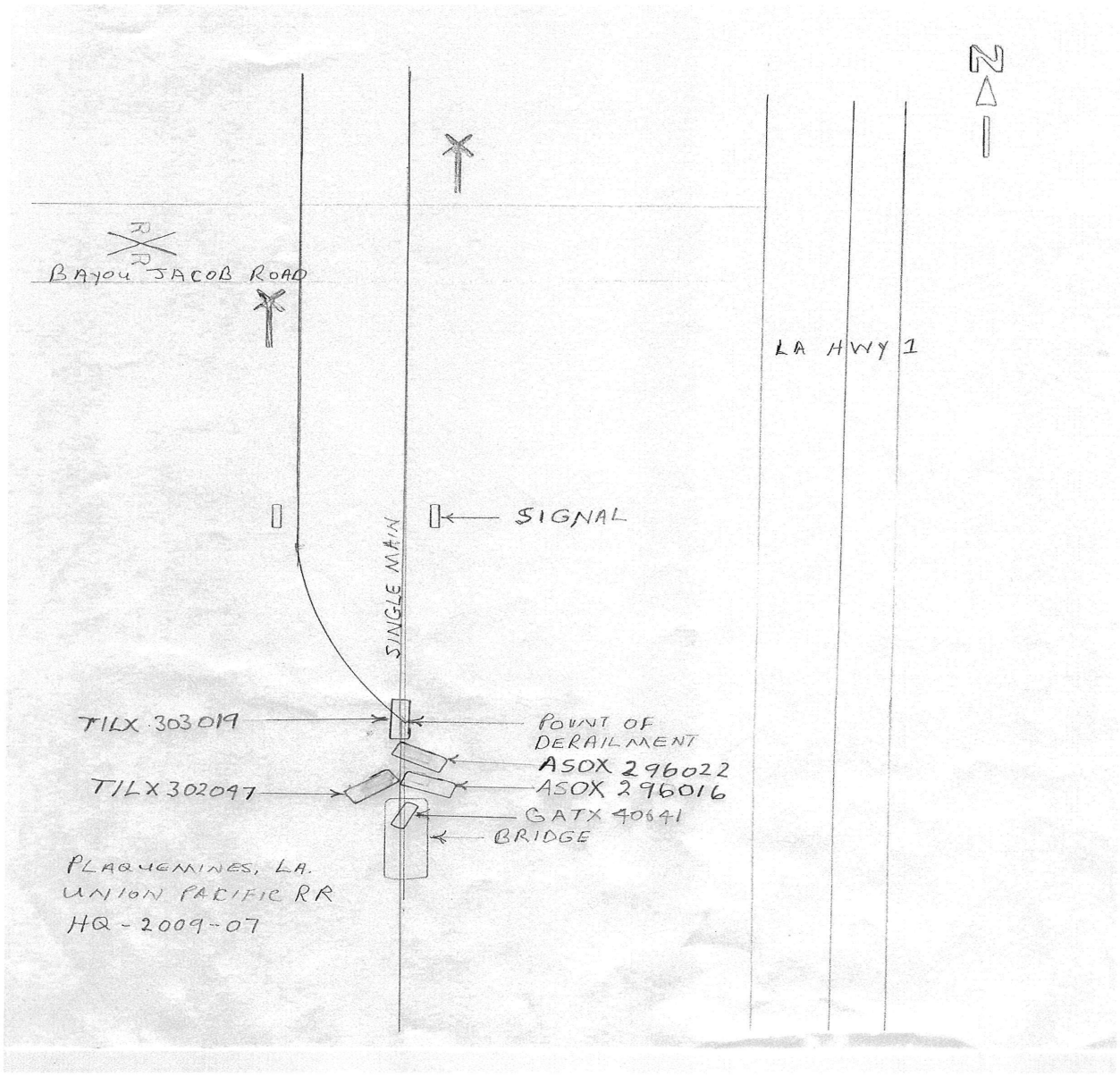
132. Locomotive Auxiliary Lights?	Code
1. Yes 2. No	N/A

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

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

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

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



137. SYNOPSIS OF THE ACCIDENT

Southward UP mix freight train LLL66-06 departing Livonia Yard derailed five hazardous material cars at milepost 85.5 on the Livonia Subdivision in Plaquemine, Louisiana, at 4:45 a.m. CST on March 7, 2009. The train had two locomotives (UP 2260 in lead and UP 2483) with 7 loaded rail cars and 50 empty rail cars consisting 2,285 tons and was 3,448 feet including engines length.

The crew was headed back to Donaldsonville on CTC territory, single main track, with a posted speed of 50 MPH at milepost 88.0, when the engineer using dynamic brake reduced the train speed from 49 MPH to 24 MPH according to the event recorder approximately 380 feet north of derailment site. The crew stated they felt a surge approximately 300 feet north of the derailment site while traveling at 24 MPH. The train went into emergency 300 feet north of site at a speed of 16 MPH. The posted track speed reduces to 20 MPH at milepost 85.5. by timetable order. There were no injuries to the crew. There was an evacuation of 100 individuals from the Best Western Hotel located approximately 100 yards east of the derailment.

It was dark and cloudy. The temperture was 62 degrees F.

GATX 40641 a loaded tank car containing 15,000 gallons of molten sulfur had a gash in the side, resulting tin the spillage of product into the Bayou Plaquemine Waterway. The Coast Guard, State, and local authorities set a berm in the Bayou to prevent the molten sulfur from spreading. Estimated damages to equipment, track, and bridge were near $1 million.

The derailment was caused by a journal roller bearing overheating. The journal was burnt off at the No. 3 position. There were no contributing factors.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT:

The Union Pacific (UP) train crew consisted of a locomotive engineer, and a conductor. They went on duty at 6:00 p.m. CST on March 6, 2009, at Donaldsonville, Louisiana, and received the required statutory off duty rest period prior to reporting to duty. The train crew job history indicated that they were off duty 11 hours and 20 minutes prior to reporting for duty. They were scheduled to travel to Livonia, Louisiana, with a train designated as UP LLL66-06. According to the conductor's report, they departed Donaldsonville at 9:15 p.m. and arrived at Livonia at 1:00 a.m. The trip was uneventful.

The train arrived in the UP Livonia Inbound Rail Yard, where the freight cars were cut off and the locomotive consist was moved to the outbound yard. According to the conductor, they were in Livonia approximately four hours. The conductor used part of that four hour time period to collect cars for the return trip consist to Donaldsonville.

The train symbol remained the same on the return trip to Donaldsonville. The train consisted of two locomotives, seven loaded rail cars, and 50 empty cars of mix freight. The train was given a pre-departure inspection and a Class I train air brake test by qualified Mechanical Inspectors in Livonia Yard. The End of Train Device (EOTD) was tested and determined to be operating properly. No exceptions were noted to the Class 1 air brake test.

The train departed Livonia at 4:05 a.m. The engineer was seated at the control stand on the left side of the lead locomotive with the short hood forward. The conductor was seated on the right side of the locomotive in the front tandem seat. As the southbound train approached the accident area, it passed through two hot box detectors located at mileposts 100 and 108. There were no defects reported by the detectors. The hot box detector at milepost 100 was later tested by the railroad. No exceptions were noted.

Approaching the accident site from the north, the railroad track is tangent for 1,700 feet to the point of derailment and 300 feet beyond. The grade is practically level.

The railroad timetable and geographic direction is south. Timetable directions are used throughout this report.

FREIGHT CAR GATX 40641:

The failed component of freight car GATX 40641, which eventually caused the train derailment, was inspected on two occasions at Livonia Yard prior to departure. The freight car was a loaded tank car that originated at Hartford, Illinois, on the Norfolk Southern Railroad (NS). It was received in interchange from NS Railroad and arrived in Livonia yard on UP Train No. AASLI-04 on March 5, 2009. The car received an inbound inspection by UP Car Inspectors assigned by the railroad. It was again inspected during the Class I train air brake test on March 7, 2009 from 02:00 a.m. to 02:30 a.m. by qualified UP Mechanical Inspectors. The car departed Livonia Yard on UP Train LLL66-06 without incident.

THE ACCIDENT:

Southward UP train LLL66-06 was being operated at 49 mph approaching the accident area. The train crew's view was unobstructed. At the time the accident occurred, the train was being operated at 16 mph. Both speeds were recorded by the event recorder of the controlling locomotive. The maximum authorized speed for mixed freight trains in this area is 60 mph, as designated by the current Union Pacific Houston Area Timetable No. 4.

As the train passed the accident site, it experienced an undesired train induced emergency air brake application. After coming to a complete stop, the engineer stated that the train dispatcher called to report that individuals observed sparks coming from his train. After determining that the train line air was not being restored, the conductor began walking back to inspect the train and discovered that the ninth through the thirteenth cars in the train were derailed. The following freight cars derailed:

Tank car GATX 40641 had all wheels derailed on the bridge and molten sulfur was leaking into Bayou Plaquemine waterway as a result of damages incurred in the derailment.

Car ASOX 296016 turned over to the east side of track and was pointed toward Bayou.

Car TILX 302047 turned over to the west side of the track and was pointed toward Bayou.

Car ASOX 296022 turned over to the east side of track and was pointed toward Bayou.

Tank car TILX 303019 came to rest upright with the south truck off the rail.

The conductor also observed small fires underneath rail car GATX 40641 that emptied its contents into the Bayou Plaquemine Waterway.

A short time later, Plaquemine Police department and Plaquemine Fire Department arrived on the scene. Louisiana State Police, Hulcher Service, Louisiana Department of Environment Quality, and Conoco Phillips Company were dispatched to derailment site.

Plaquemine Fire Department began extinguishing small fires near the molten sulfur car. The Department of Environment Quality set up to monitor water and air quality. The molten sulfur began to harden and block itself off at 10:08 a.m. At 1:24 p.m., Hulcher and the railroad were given permission to start re-railing cars and clearing the accident site.

There were no injuries reported as a result of the accident. Louisiana State Police and Plaquemine Fire Department collectively initiated the evacuation of individuals in close proximity of the accident site. There were approximately 100 individuals evacuated from the Best Western Hotel located about 100 yards east of Louisiana highway 1 which runs parallel to the Union Pacific (UP) main track in the area.

ANALYSIS AND CONCLUSION:

ANALYSIS-CLASS I TRAIN AIR BRAKE TEST

UP Train LLL66-06 was given a pre-departure inspection and a Class I air brake test by qualified mechanical inspectors assigned by the railroad. No exceptions were noted. The EOTD was inspected and no exceptions noted.

CONCLUSION:

The Class I Air Brake Test was performed by qualified mechanical inspector at Livonia Yard. There were no exceptions noted.

ANALYSIS-LOCOMOTIVE SAFETY DEVICES:

The locomotives were inspected by machinists on duty at Livonia on March 7, 2009, at 6:27 a.m. The lead locomotive was equipped with headlights, auxiliary lights, and audible warning device required by FRA regulations. No exceptions were noted.

CONCLUSION:

The locomotives safety devices were in full compliance of Railroad rules and Federal regulations.

ANALYSIS-EVENT RECORDER:

FRA analyzed the event recorder data provided by the Union Pacific Railroad downloaded from the leading locomotive. The data suggested that the engineer reduced the speed of the train from 49 MPH to 24 MPH about 380 feet north of the derailment site. The train speed, amperage, and throttle position was being systematically reduced until the unintentional emergency train air brake application occurred.

CONCLUSION:

The data suggests there were no exceptions to the engineers train handling characteristics prior to the derailment and subsequent emergency brake application.

ANALYSIS-JOURNAL:

Tank car GATX 40641 had a burnt off journal. It was the first car to derail and was the probable cause of derailment. The wheel was a heat treated curse plate 36 inch wheel. It was manifested by Griffin Wheel Company in September, 1992. No exceptions were taken to a post derailment inspection of the wheel. The wheel bearing internal material was destroyed. The wheel and the axle were sent to R&D Lab in Omaha, Nebraska, for analysis.

ANALYSIS-TOXICOLOGICAL:

The accident met the criteria for FRA Post Toxicology Testing as required under Title 49 CFR, Part 219, and Subpart C. The crew received Post Accident Toxicology testing (blood and urine) at Prime Medical Occupation Clinic, located in Port Allen, Louisiana.

CONCLUSION:

Test results were negative for the collected samples of the engineer and conductor.

ANALYSIS-TRACK:

The track was last inspected on March 5, 2009 with no defects discovered. The investigation of the derailment determined that the initial point of the derailment was at milepost 85.5 near the south siding track access switch. No exceptions were taken by the Union Pacific Railroad Manager of Track maintenance at this location.

CONCLUSION:

Track conditions did not contribute to the derailment.

FATIGUE ANALYSIS:

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings.

FRA obtained fatigue related information, including a 10 day work history, for two employees involved in this accident (the engineer and conductor).

FRA concluded fatigue was probable for the locomotive engineer and the conductor assigned to this train, however the suggested fatigue conditions for these two employees did not contribute to the accident.

CONCLUSION:

FRA concluded fatigue was probable. Although fatigue was a factor for this train crew, the cause of accident was defective equipment and no human factors contributed to the accident.

PROBABLE CAUSE:

The primary cause as listed by the Union Pacific Railroad, Derailment Cause Finding and Prevention Manual, is E53C, journal roller bearing failure, overheating. FRA agrees with the UP assesment and conclusion of the cause. There were no contributing factors.