Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-12

Kansas City Southern Railway Co. (KCS)
Hattiesburg, Mississippi
March 8, 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-2007-12

1.Name of Railroad Operating Train #1: Kansas City Southern Rwy Co. [KCS]	1a. Alphabetic Code: KCS	1b. Railroad Accident/Incident No.: 07030801
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: Kansas City Southern Rwy Co. [KCS]	4a. Alphabetic Code: KCS	4b. Railroad Accident/Incident No.: 07030801
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 03 | Day 08 | Year 2007	7. Time of Accident/Incident: 08:30: ☑ 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
28	5	2	212	Southeastern

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Hattiesburg	63.8	N/A	MS	FORREST

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
58 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
single main 500	1	1.19	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	LGP10108

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?
11 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): 6600	Code(s): k | N/A | N/A | N/A | N/A	0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	ATW122033	8	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	0

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

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	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	54	0	4	0	0
(2) Total Derailed	11	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
163520	35874	T207	T207

Number of Crew Members

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

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 2 Mi 30	Hrs 2 Mi 30

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	4

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

52. Caboose Occupied by Crew? 1. Yes 2. No: 2

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?
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

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57. Trailing Tons (gross tonnage, excluding power units): 0

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

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

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 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

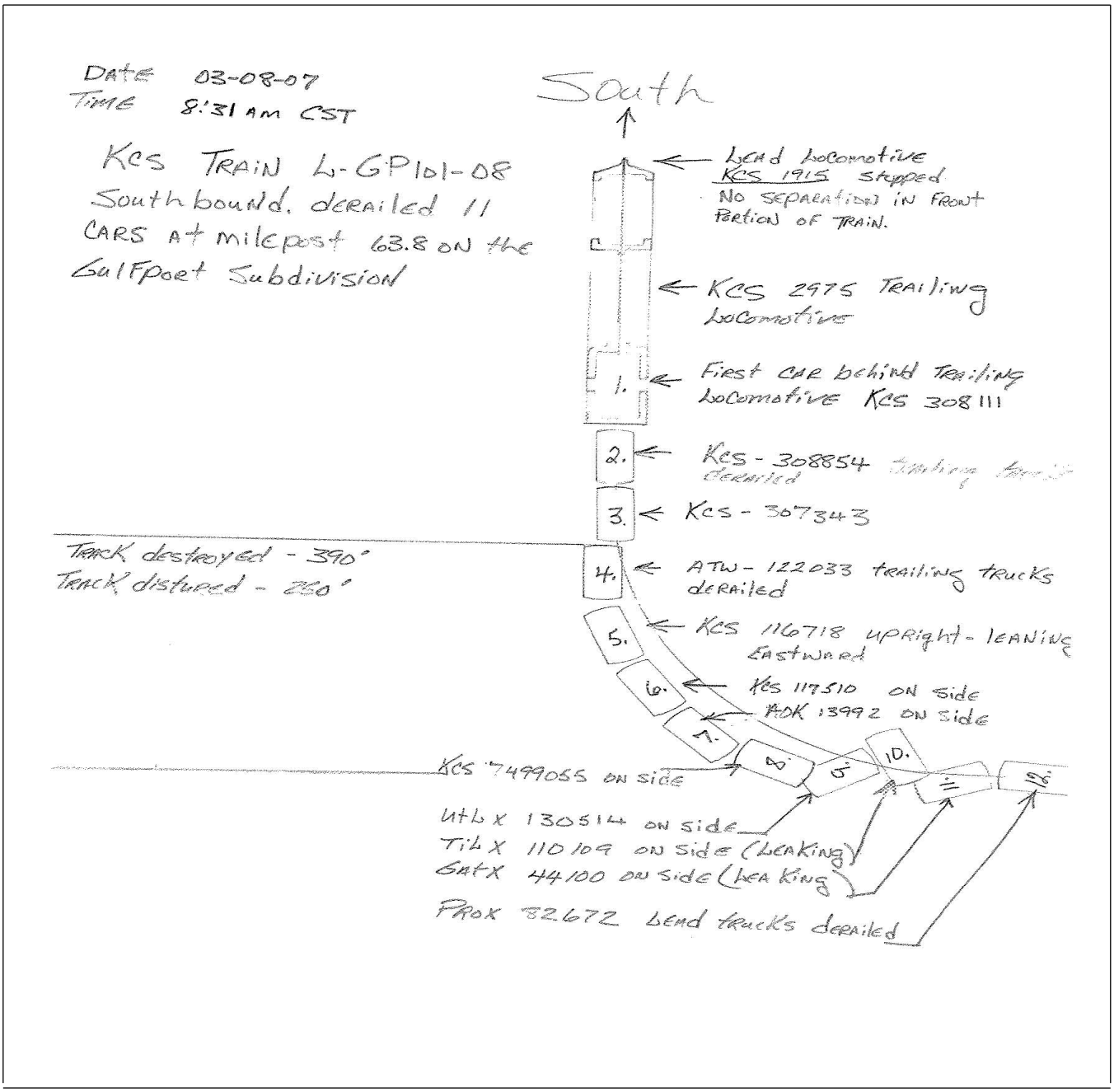
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)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

Synopsis

On March 8, 2007, at 8:31 a.m. Central Standard Time (CST) southbound Kansas City Southern (KCS) freight Train LGP10108 derailed at milepost (MP) 63.8 on the Southeastern Division, Gulfport Subdivision in Hattiesburg, Mississippi (MS). The train crew consisted of an engineer, conductor, and brakeman. They reported for duty on March 8, 2007, at 6 a.m. in Hattiesburg. Their train consisted of four locomotives, 54 loads, four empty cars, weighed 6,600 tons and was 3,418 ft. in length. Train LGP10108 was en route to Gulfport, MS.

The speed limit for the Gulfport Subdivision is 25 miles per hour (mph), but at MP 63.8 a 10 mph speed restriction was in effect, per track bulletin No. 923. Train LGP10108 was traveling at a recorded speed of 11 mph prior to the derailment. At 8:31 a.m., the train traversed MP 63.8 and the crew felt a surge in the locomotive shortly before an unintended emergency brake application occurred. After the train stopped, the train crew noticed the fifth car behind the trailing locomotive was derailed and could see yellow smoke rising from a car further back in their train.

The engineer notified the KCS train dispatcher, and KCS notified local police and emergency authorities. The first responders issued an evacuation ordered for about a mile and a half radius of the derailment site. At 10:30 a.m. the United States Environmental Services (USES) arrived on the scene and inspected the train. They found 11 cars derailed with two tank cars ruptured releasing sodium hydroxide and hydrochloric acid.

There were no injuries to the KCS train crew. Two USES employees and three citizens exposed to hydrochloric acid were treated and released from the local hospital. Rail equipment damage is $163,520 and track damage is $35,874.

At the time of the derailment, it was daylight and clear with a slight breeze. The temperature was 58 °F.

The probable cause of the accident is the first broken rail from the 80% detail fracture and a contributing cause of the 20% detail fracture causing a 33" piece of rail to roll out of the track.

138. NARRATIVE

Circumstances Prior To The Accident

The crew of Train LGP10108 consisted of a locomotive engineer, conductor, and brakeman. They went on duty on March 8, 2007, 6 a.m. at the CN Bell-yard Terminal in Hattiesburg and received eight hours off duty time prior to reporting for duty. The brakeman used his automobile to travel from the motel at Hattiesburg en route to Gulfport where he was going to meet Train LGP10108 and assist with yard switching. The engineer and conductor drove to Bell Yard and received KCS track bulletin No. 923 and train consist paperwork. They boarded the train at MP 67, which was located at the south end of Bell Yard. Train LGP10108 received a Class 1 brake test prior to departing Bell Yard.

Train LGP10108 consisted of four locomotives (KCS 1915, 2960, 2854, and 2875) with 54 loads, 4 empties, 6,600 tons, and 3,418 ft in length. Train LGP10108 proceeded south to MP 65 at the yard-limit board sign. The crew received Direct Train Control (DTC) authority No. 5706 at 7:53 a.m., via the radio from the KCS train dispatcher. Train LGP10108 departed the Bell Yard on the Gulfport Subdivision main line track toward Gulfport. Train LGP10108 made a pick-up of 11 cars at Palmer siding and proceeded toward MP 63.8.

As the southbound train approached the accident area, the engineer was seated at the controls on the west side and the conductor was on the east side of the leading Locomotive KCS 1915. The engineer was operating the train at a recorded speed of 11 mph when he entered the curve at MP 64. This curve is a 4-degree right hand curve and is 1,833 ft in length with a .64 ascending grade. At this location, the rail size is 90 lbs. jointed rail with mill dates of 1925 and 1926.

KCS timetable direction is north/south and geographic direction is north/south. KCS timetable direction is used for this report.

The Accident

The engineer said when Train LG10108 was in the curve at MP 63.8 the locomotives suddenly bolted forward. The train went into an undesired emergency brake application derailing the 2nd and 4th through 13th cars behind the last locomotive. About 8:30 a.m. the crew notified the train dispatcher by radio of the derailment. They also reported white smoke coming from one of the derailed cars. The KCS train dispatcher notified their Critical Incident Desk (CID) who in turn called the proper emergency authorities. In addition to fire and local police, Hulcher Derailment Services and United States Environmental Services (USES) were called to the scene.

About 9 a.m. Forrest County Emergency Management District (EMD) arrived on the scene. About 9:55 a.m. two USES responders walked toward the derailment site and declared there was chlorine released. They immediately returned to the command center because they were not wearing proper personal protection for this type of exposure. Both were treated at the scene and sent to the local hospital for treatment. EMD ordered an evacuation that covered a mile and one-half radius from the hazardous release site. The evacuation zone affected about 80 households. EMD developed a temporary

command post near the accident scene to handle the incident.
About 10:20 a.m. a USES responder with Level B protective equipment made an inspection of the rail cars to determine which cars were releasing hazardous material. He determined the release was not chlorine, but two tank cars, TILX 110109 and GATX 44100, releasing product containing hydrochloric acid and sodium hydroxide. About 12:10 p.m. USES responders determined the product had reached Meyers Creek and started spill control neutralization and containment procedures. The product was neutralized with lime and earthen dams for containment. About 12:15 p.m. Hulcher Derailment Services arrived at the accident scene to start the clean up. About 12:17 p.m. Center for Toxicological, Environmental and Health (CTEH) arrived on the scene to monitor exposure concerns.

On March 9, 2007, early morning, Hulcher Derailment Services continued re-railing operations and clearing the site. KCS track crews were briefed on the safe locations and hazards at the scene and began receiving track material at 8 a.m. About 9:36 a.m. Hulcher removed the last car from the main track and track rebuilding began. The main track was open and back in service at 9:55 p.m.

Under Federal Railroad Administration (FRA) guidelines, KCS managers arranged for post accident toxicology testing of the train crew at Forrest General Hospital in Hattiesburg.

Analysis and Conclusion

Analysis

The investigation revealed that the train event recorder indicated a speed of 11mph prior to an emergency brake application. The data indicated the engineer was in the 4th throttle position prior to an undesired emergency brake application. No exceptions to train handling operations.

The maximum speed for the main line track is 25 mph, which requires the railroad to conduct, at a minimum, a weekly track inspection. The accident location was last inspected by a KCS track inspector on March 5, 2007, with no FRA defects noted in the derailment area.

The track consists of 90 lb. rail installed in 1926, with track spikes and wood crossties. In 2006, a geometry car tested the Gulfport Subdivision with no exceptions noted in the derailment area. The Gulfport Subdivision currently receives a bi-annual test of continuous search for internal rail defects. On February 19, 2007, Rail Technology International (RTI) Car PRTI No. 479 completed rail testing through the accident location with no exceptions noted. RTI completed the 79.5 miles of rail testing on the Gulfport Subdivision on February 23, 2007, with a total of 126 internal rail defects identified. On March 9, 2007, KCS discontinued the services of RTI on their system. On March 12, 2007, KCS deployed Sperry Rail Services Car No. 951 to conduct a post accident rail test on the Gulfport Subdivision. On March 21, 2007, Sperry completed their rail tests with a total of 336 internal rail defects identified.

Sperry identified five internal rail defects through the accident location, one being a 24 inch Head Web Separation Open (HWO) in the high-rail of the curve. Overall, Sperry identified 175% more internal rail defects than RTI in the 79.5 miles of track. RTI resulted a 1.53 defect ratio per mile, while Sperry resulted a 4.23 ratio. RTI identified one Transverse/Detail Fracture (TD/DF) internal rail defect over the 79.5 miles tested, Sperry identified 136.

Results of the toxicology tests of the train crew at Forrest General Hospital in Hattiesburg were negative.

Fatigue Analysis
FRA obtained fatigue related information, including a 10-day work history, for three KCS employees involved in this accident, including the engineer, brakeman, and conductor of Train LGP10108. If the employee did not provide sleep information, the default setting of excellent was used. FRA has concluded fatigue was not probable for the following employees: the engineer, conductor, and brakeman of Train LGP10108.

Fatigue Conclusions
Fatigue was not probable for the engineer, conductor nor brakeman.

Conclusion

At the accident scene the KCS Engineering Department recovered a section of rail from the high side, east side of the curve, with two breaks 33 inches apart. The two breaks were identified as an 80% Detail Fractures (DF) about one inch in diameter, and another 20% DF about three-eighths inch in diameter. Both breaks were on the gage side of the east rail head. The 80% break was the northern most break, the 20% break 33" south of it.

Rail-end batter existed on the north side of the 80% DF with a slight discoloration in the break, which shows this rail broke under the previous northbound train the night before the accident. The continuous vertical induced train forces of Train LGP10108 over the rail, which caused the 20% DF to break completely through. The 33" section of rail rolled out from the track causing the train to derail.

The Federal Railroad Administration found a contributing cause to be a 20% detail fracture causing a 33" piece of rail to roll out of the track.

The FRA found the probable cause of the accident to be the first broken rail from the 80% detail fracture.