Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-45

Kansas City Southern (KCS)
Saginaw, KS
April 20, 2008

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-2008-45

1.Name of Railroad Operating Train #1: Kansas City Southern Rwy Co. [KCS]	1a. Alphabetic Code: KCS	1b. Railroad Accident/Incident No.: 08042001
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.: 08042001
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 04 | Day 20 | Year 2008	7. Time of Accident/Incident: 03:27: ☐ 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
0	N/A	N/A	0	Midwest

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Saginaw	160.1	N/A	MO	NEWTON

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
70 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. West — Code
Single Main Track	4	40.56	1

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	GSLKCS15

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?
43 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)*: 2479

Code(s): k | N/A | N/A | N/A | N/A — 31a. Remotely Controlled Locomotive?: 0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	KCS4048	6	N/A
(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

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	6	0	0	0	0
(2) Total Derailed	1	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	0	0	80	0	0
(2) Total Derailed	N/A	0	33	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$214,106.00	$863,569.00	T111	T099

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	46. Conductor
Hrs 7 Mi 27	Hrs 7 Mi 27

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	1	0	0

50. EOT Device? 1. Yes 2. No — 1

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

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

OPERATING TRAIN #2

53. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip. — Code	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

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

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
N/A	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	N/A	N/A

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)*	
	N/A

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

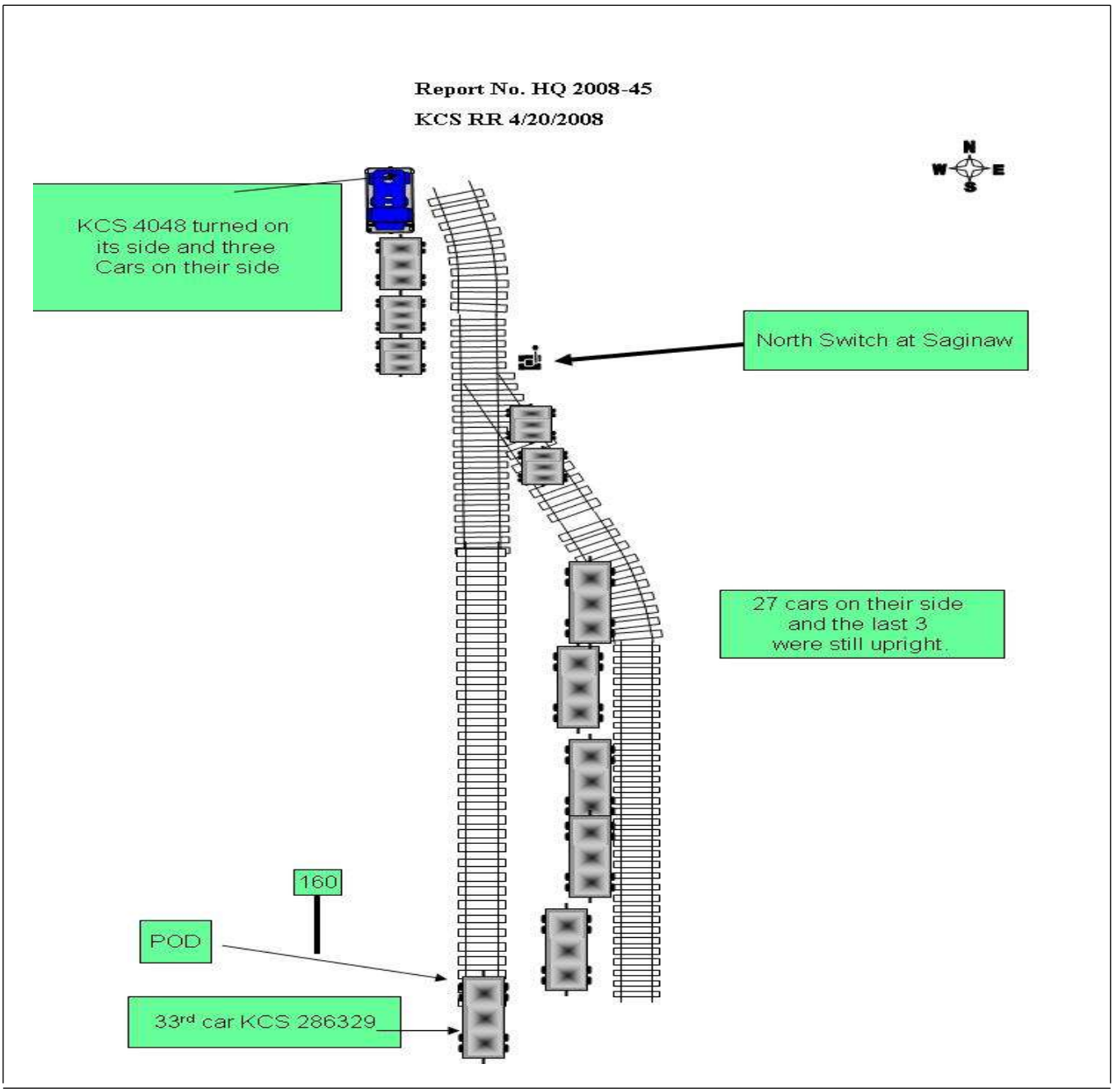
132. Locomotive Auxiliary Lights?	Code
1. Yes 2. No	N/A

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

Northbound Kansas City Southern (KCS) empty grain Train # GSLKCS-15 derailed the sixth locomotive and 33 empty grain cars on April 20, 2008 at 3:25 p.m. CST. The accident occurred near Saginaw, Missouri at KCS Milepost (MP) 160.1 on the KCS Heavener Subdivision.

At the time of the accident it was daylight and clear. The temperature was an estimated 70 F.

The equipment damage was estimated at $ 214,106. Track damage was estimated at $ 863,569. There was no signal damage. The KCS Locomotive # 4048 turned over and spilled an estimated 400 gallons of diesel fuel. The local fire department contained the spill.

Following the accident the engineer reported he hit his back on the seat of the locomotive and requested medical assistance.

The probable cause of the accident is FRA Cause Code T-111; wide gage due fasteners not sufficient enough to hold gage from vertical impact. The contributing cause is FRA Cause Code T-099; fouled and insufficient ballast.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of northward KCS Unit Grain Train # GSLKCS-15 included a locomotive engineer and a conductor. They first went on duty at 8:00 a.m. CST on April 20, 2008 at Heavener Yard in the city of Heavener, Oklahoma. This is the away-from-home terminal for both crewmembers and each had the required statutory off-duty rest period prior to reporting for duty.

The assigned freight train consisted of six locomotives on the head-end. The lead, the second and the fifth locomotives were online; the third, fourth and the sixth locomotives were isolated. There were 80 empty grain hopper cars and an end-of-train device (EOTD) # UPRQ 34423. The train was 5,250 feet in length, and the weight was listed at 2,479 tons. The train was scheduled to travel to Kansas City, Missouri. The train received an initial terminal train air brake test at Laredo, Texas by the mechanical personnel and had arrived at Heavener at 3:20 a.m. No other test was required. The train departed Heavener at 9:05 a.m. CST.

As the train approached the accident area, the locomotive engineer was seated at the controls on the east side of the lead locomotive. The conductor was seated on the west side of the lead locomotive. The railroad timetable direction of the train was north, and the geographic direction was north. Timetable directions are used throughout this report.

The train was coming out of a right-hand 2-degree curve at MP 160.4 onto 3,000 feet of tangent track and approaching the south Saginaw switch at MP 160.2. The grade at this location is 0.50-percent ascending. The track was constructed with 136 lb. Continuous-Welded Rail (CWR) on wood crossties and the spike pattern is two spikes on the gage side, one spike on the field side, and two anchor spikes. The anchor pattern was every other tie boxed anchored.

THE ACCIDENT

The train was being operated at 45 mph approaching the accident area. At the time the accident occurred the

train was being operated at 43 mph. Both speeds were recorded by the event recorder on Locomotive # KCS 4577. The maximum authorized track speed is 50 mph as indicated in KCS Timetable # 7 dated July 1, 2006.

The engineer stated that as the train passed the South Switch at Saginaw they hit a mud hole in the track and bounced the locomotive. He stated he looked back to see if other units made it over and saw Locomotive # KCS 4048 (# 6) was derailed. At the same time the train had experienced an undesired emergency train air brake application. The rear locomotive had separated from the rest of the locomotive consist.

When the train stopped the crew did a job briefing and the conductor dismounted to inspect the damages. The engineer grabbed a fire extinguisher and went back to put out a small fire on locomotive KCS 4048. The Ragan Mill Fire Department arrived and helped extinguish the fire.

ANALYSIS AND CONCLUSION:

ANALYSIS TOXICOLOGICAL TESTING:

The two crewmembers of BNSF Train GSLKCS-15 were mandatory post-accident toxicologically tested. The test results were negative.

CONCLUSION:

Drugs and alcohol were not factors in this accident.

ANALYSIS:

FRA obtained fatigue related information for the 10-day period preceding this incident including the 10-day work history (on duty/off duty cycles) for all of the employees involved.

CONCLUSION:

Upon analysis of that information FRA concluded fatigue was not probable for any of the employees.

ANALYSIS-LOCOMOTIVE ENGINEER OPERATING PERFORMANCE:

The locomotive was equipped with a speed indicator and an event recorder as required. The relevant event recorder data was downloaded by the manager of operating practices at the accident site and analyzed at the KCS Pittsburg Yard Office in Pittsburg, Kansas.

CONCLUSION:

The locomotive engineer was in compliance with all applicable railroad operating and train handling requirements.

ANALYSIS-TRACK:

The last ultrasonic rail detection test through this area was on December 14, 2007 by Sperry Rail Car # SRS 124. There were no rail defects noted in the immediate area of MP 159 to 161. The last geometry car survey was in February by Holland Track Test Car # 480. There were not any exceptions taken in the area of the derailment. Track inspection records revealed that the track was last inspected on April 17, 2008 with a foul ballast condition 103.02 exception noted in the area of the derailment.

During the investigation it was revealed that a surfacing gang had gone to the area of the derailment on April 18, 2008. The surfacing gang had surfaced two locations between the south and north switches at Saginaw. They left the west side of this area open for drainage. The road-master told FRA that the area had a small rain shower sometime prior to the derailment. This, along with the pumping action of several trains, caused the dirt and the rock to work its way out from under the crossties allowing a 2 1/4 inch profile to work its way into the track surface.

CONCLUSION:

This geometric profile condition created an increased vertical impact by rail equipment which caused the track gage to be widened to 58 1/4 inches at the point of derailment. This condition allowed the rear trucks of Locomotive # KCS 4048, the 6th locomotive, to fall between the gage of the rails resulting in the derailment.

The railroad was not in compliance with its own standards or applicable FRA Track Standards. The train crewmembers were the only witnesses to the derailment.

OVERALL CONCLUSION:

The investigation revealed there was no mechanical, fatigue, or operating factors that contributed to the derailment. Noncompliant track conditions were found to be the primary and contributing causes.

PROBABLE CAUSE, CONTRIBUTING FACTORS, AND CONCLUSION:

The probable cause was FRA Code T-111 - wide gage due to fasteners that were not sufficient to hold gage from high vertical impact. The contributing cause was FRA Code T-099 - foul and insufficient ballast.