Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-67

CSX Transportation (CSX)
Goodlettsville, Tennessee
November 1, 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-2007-67

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 38745
2.Name of Railroad Operating Train #2: CSX Transportation [CSX]	2a. Alphabetic Code: CSX	2b. Railroad Accident/Incident No.: 38745
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: CSX Transportation [CSX]	4a. Alphabetic Code: CSX	4b. Railroad Accident/Incident No.: 38745
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 11 | Day 01 | Year 2007	7. Time of Accident/Incident: 10:03: ☐ 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
7	0	0	0	Nashville

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Nashville	180.9	N/A	TN	DAVIDSON

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
44 F	4	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	4	73	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	Q51501

29. Speed (recorded speed, if available) — Code: R - Recorded; E - Estimated 48 MPH | R

30. Trailing Tons (gross tonnage, excluding power units): 9375

31. 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): e | N/A | N/A | N/A | N/A

31a. 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

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	CEFX10254	49	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
N/A	N/A

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	65	0	26	0	0
(2) Total Derailed	21	0	3	0	0

37. Equipment Damage — This Consist: $1,300,940.00

38. Track, Signal, Way, & Structure Damage: $120,000.00

39. Primary Cause Code: T299

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 4 Mi 33

46. Conductor: Hrs 4 Mi 33

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 | N/A

51. Was EOT Device Properly Armed? 1. Yes 2. No | N/A

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	Q51401

56. Speed (recorded speed, if available) — Code: R - Recorded; E - Estimated 0 MPH | E

58. 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

58a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons (gross tonnage, excluding power units): 3240

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): e | N/A | 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)	BRIX97191	5	no
(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	7	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	13	0	60	0	0
(2) Total Derailed	0	0	11	0	0

64. Equipment Damage This Consist: $139,049.00

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

66. Primary Cause Code: T299

67. Contributing Cause Code: N/A

Number of Crew Members

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

Length of Time on Duty

72. Engineer/Operator: Hrs 1 Mi 33

73. Conductor: Hrs 1 Mi 33

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: 2

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 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	Code 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	Code N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code 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								116. Signaled Crossing (See instructions for codes)	Code N/A	117. Whistle 1. Yes 2. No 3. Unknown	Code N/A
Code(s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A				

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

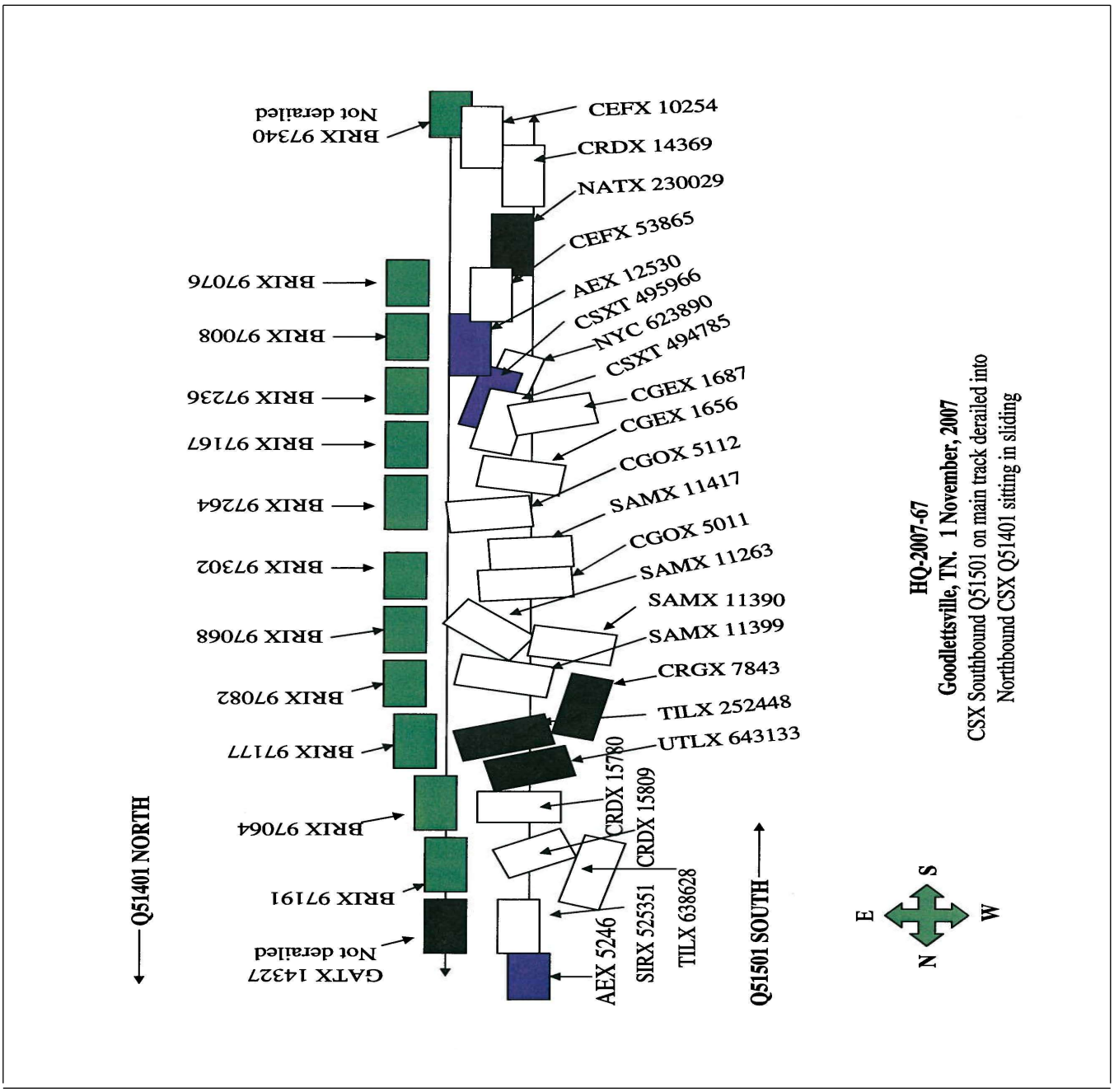
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify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

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

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

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



137. SYNOPSIS OF THE ACCIDENT

On November 1, 2007, at 10:03 p.m. Central Standard Time (CST), CSX Transportation, Inc. (CSX) southbound freight Train Q51501, consisting of four locomotives, 65 loads, and 26 empties, derailed 24 cars from the main track at milepost (MP) 180.9 on the CSX Nashville Division, Henderson Subdivision, in the city of Goodlettsville, Tennessee (TN).

CSX Train Q51501 was traveling at a recorded speed of 48 miles per hour (mph) at the time of the derailment. The derailed cars impacted cars of CSX Train Q51401 that was standing in Goodlettsville passing siding resulting in 11 additional cars to derail.

As a result of the derailment and collision, there was no hazardous material spilled and there were no personal injuries. CSX estimated the damages at $120,000 for track and structures and $1,439,989 for equipment.

At the time of the derailment, it was dark, the sky was clear, and the temperature was 44 °F.

The probable cause of the derailment is a broken rail caused by a reverse detail fracture defect.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

CSX Train Q51501

On November 1, 2007, after completing a required statutory off-duty period, the crew of CSX Train Q51501 went on duty at 4:30 p.m. in Evansville, Indiana. The crew consisted of an engineer and conductor. They had a job briefing, which included operating CSX Train Q51501 from Evansville, IN to Nashville, TN on the CSX Nashville Division, Henderson Subdivision, a distance of about 158 miles. The crew performed a locomotive inspection and a Class III train brake test using the end-of-train device (EOT). CSX Train Q51501 consisted of four locomotives (lead locomotive NREX 8865, NREX 5087, CP 5941, and CEFX 3123), 65 loads and 26 empties, which included six hazardous material cars (four loads and two residue cars). The train was 5,763 in length and weighed 9,375 tons. The crew departed Evansville (MP 322) at 5:40 p.m. southbound toward Goodlettsville.

CSX Train Q51401

On November 1, 2007, after completing a required statutory off-duty period of 13 hours, the crew of CSX Train Q51401 went on duty in Nashville, TN at 7:30 p.m. The crew consisted of an engineer and conductor. They had a job briefing, which included operating CSX Train Q51401 from Nashville, TN to Evansville, IN.

CSX Train Q51401 departed Nashville's Radnor Yard at 8:41 p.m. (MP 190) with seven locomotives, 13 loads (one hazardous material car), 60 empty cars, and was 4,647 feet in length, weighing 3,240 tons. The crew received a medium approach signal at the South Goodlettsville Siding control point (CP), MP 179.3. They proceeded northward and were routed into the Goodlettsville Siding CP, MP 181.1. The engineer remained seated on the east side of the cab at the locomotive controls and the conductor dismounted the locomotive on the east side to observe the passing of CSX Train Q51501.

As CSX Train Q51501 approached Goodlettsville Siding, the engineer was seated in the cab at the controls of

lead Locomotive NREX 8865 and the conductor was on the east side of the cab. The southbound train was traveling at a recorded speed of 48 mph as it approached Goodlettsville Siding.

The mileposts decrease in the southbound direction of travel. The grade in the direction of travel averages about 0.9% descending grade between MP 186.0 and MP 181.3, then averages about 0% between MP 181.3 and MP 180.3. Beginning at MP 182.1 and in the direction of travel, the track alignment starts with a 1 degree 7- minute to 1 degree 52-minute curve to the left for 3,500 feet, which is followed by a tangent of about 2,000 feet. Then there is a 1 degree 30-minute curve to the right where the derailment occurred.

The CSX timetable direction of CSX Train Q51501 was south. The geographical direction is southeast. Timetable directions are used throughout this report.

THE ACCIDENT

The engineer was operating CSX Train Q51501 at a recorded speed of 48 mph in the idle position approaching Goodlettsville Siding. The maximum authorized speed from MP 184.5 to MP 177.0 is 50 mph, as designated in the CSX Nashville Division Timetable No. 3. The train passed north Goodlettsville CP at 10:03 p.m. when an uninitiated emergency braking application of the train air brake system occurred. Moments later CSX Train Q51401, which was stopped on Goodlettsville, also had an undesired emergency application of the train air brakes. Both train crews called the dispatcher and reported their situations. The engineer and conductor of CSX Train Q51501 said they did not see or feel any unusual conditions prior to the uninitiated brake application.

CSX Train Q51501 stopped near MP 180.2. The conductor walked back to inspect the train and discovered the first 48 cars separated from the remainder of the train. He also found the 49th through the 72nd cars had derailed into the rail cars of CSX Train Q51401. The conductor of CSX Train Q51401 performed a walking inspection of the train and discovered the 5th through the 15th cars derailed as a result of the impact from CSX Train Q51501. No hazardous commodities were involved in the derailment.

The Goodlettsville/Metro Fire and Goodlettsville Police Departments arrived at the scene at about 10:15 p.m. and CSX management arrived at the accident around 11:30 p.m. On November 2, R.J. Corman contract derailment clean up crews began arriving about 12:45 a.m., and the Federal Railroad Administration (FRA) track and mechanical inspectors arrived at 1:30 a.m. The Goodlettsville Police set up a security perimeter around the accident site upon their arrival until about 3:15 a.m.

ANALYSIS AND CONCLUSION

ANALYSIS

The event recorder on the lead locomotive could not be downloaded by CSX road foreman of engines. The event recorder on the second Locomotive NREX 5087 was downloaded and the data showed CSX Train Q51501 was traveling at a recorded speed of 48 mph while making a transition out of dynamic breaking. A review of the locomotive event recorder revealed no indications of improper train handling or excessive forces. Additionally, when CSX Officials performed a simulation test of the train's movement, they found the train forces to be within acceptable parameters.

FRA and CSX personnel made a walking inspection of the undisturbed track from a point north of the point of derailment (POD), at MP 180.9, through the turnout at North Goodlettsville, MP 181.3. The FRA Part 213 of CFR 49 inspection included evaluating the geometry for a contributing cause to the derailment. No defects were found during the inspection.

FRA reviewed CSX's track inspection records for defective conditions they found during inspection conducted of the derailment area. No defects were noted by CSX, and FRA took no exceptions to the CSX records.

CSX's TGC-2 Geometry Car tested this main track section on June 12, 2007, and found no defects in the area. FRA's DOTX 217 Geometry Car tested this main track on September 6, 2007, and found no defects in the area.

Federal regulations require CSX to test rail for internal defects at a frequency of once a year or every 40

million gross tons (MGT), whichever is shorter. On this subdivision, CSX designated a rail testing cycle of 62 days. Sperry Rail Services is contracted by CSX to test this rail line. They inspected this location on October 26, March 9, May 30, August 13, and October 2, 2007, and found no internal rail defects. CSX reported no service failures in the area during the previous year.

FRA reviewed CSX's signal tests and concurred that no signal system failures contributed to the derailment.

Mechanical field inspections were conducted by CSX and FRA. These inspections included evaluating any evidence that would have contributed to the cause of the derailment. There were no defective conditions or evidence found which might have contributed to the accident cause. There were marks found on the wheels of the 45th, 46th, 47th, and 48th cars. The marks were all found on the wheels riding on the east side rail. This side is the outer rail or high side of the curve. A mark on the 48th car was very typical of a wheel mark caused by a broken rail.

FRA and CSX inspectors found several broken rail sections on the main track, about 892 feet south of MP 181. The POD was determined to be near MP 180.8. One rail section exhibited a detail fracture and was located on the north end of the broken rail. This piece and other fractured rail pieces were found in the immediate vicinity of the derailment, and all were located on the east rail. Collectively, these 136 lb. rail sections exhibited fatigue, cracks, rail-end batter, and were date stamped 1984, RE W-P (Wheeling-Pittsburgh). The rail also exhibited a significant amount of wear on the head and gage section. It is estimated that between 750-1000 million gross tons (MGT) of freight cargo have traversed over this portion of track since CSX installed it. The gage and the head wear of the fractured pieces measured 11/16 of an inch. The gage side and top of the east rail head also exhibited transverse surface cracks (head checking) and chipping.

FATIGUE ANALYSIS

FRA obtained fatigue related information, including a 10-day work history, for all of the employees involved in this incident.

FATIGUE CONCLUSION

FRA concluded that fatigue was not a problem for any of these employees.

CONCLUSION

The FRA determined evidence points to the east or outer rail breaking and was broken in several locations. The broken pieces included detail fractures and fatigue cracks. Lead in rail batter was found on one piece. This rail had significant wear reducing the cross-sectional area. The derailing action of the pile up indicates cars leaving the track from the east side. No other evidence was found contributing to the cause.

Probable cause of the derailment is a broken rail caused by a reverse detail fracture defect.