Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-69

CSX Transportation (CSX)
Arcadia, NC
August 15, 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-2008-69

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 000050512
2.Name of Railroad Operating Train #2: CSX Transportation [CSX]	2a. Alphabetic Code: CSX	2b. Railroad Accident/Incident No.: 000050512
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.: 000050512
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 08 | Day 16 | Year 2008	7. Time of Accident/Incident: 07:06: ☑ 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
40	2	1	0	Florence

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
East Arcadia	SE0336.7	N/A	NC	COLUMBUS

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
72 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
main line	3	13.6	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	Q47815

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?
17 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: 0

30. Trailing Tons *(gross tonnage, excluding power units)*: 10990

Code(s): k | 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)*	RBOX34132	53	yes
(2) Causing *(if mechanical cause reported)*	SOU550516	54	yes

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	3	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	75	0	63	0	0
(2) Total Derailed	5	0	5	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$358,839.00	$45,000.00	E39C	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	46. Conductor
Hrs 9 Mi 36	Hrs 9 Mi 36

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 — 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
1	1	N46104

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 | R	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)*: 3446

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): k | 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)*	CSXT735	1	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

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	3	0	0	0	0
(2) Total Derailed	1	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	100	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: $100,000.00

65. Track, Signal, Way, & Structure Damage: $45,000.00

66. Primary Cause Code: E39C

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 4 Mi 6

73. Conductor: Hrs 4 Mi 6

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	2	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: 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. Code: N/A
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)*

108. Vehicle Speed *(est. MPH at impact)*: N/A

109. *geographical)* Code: N/A
1.North 2.South 3.East 4.West

Rail Equipment Involved

111. Equipment Code: N/A
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)*

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

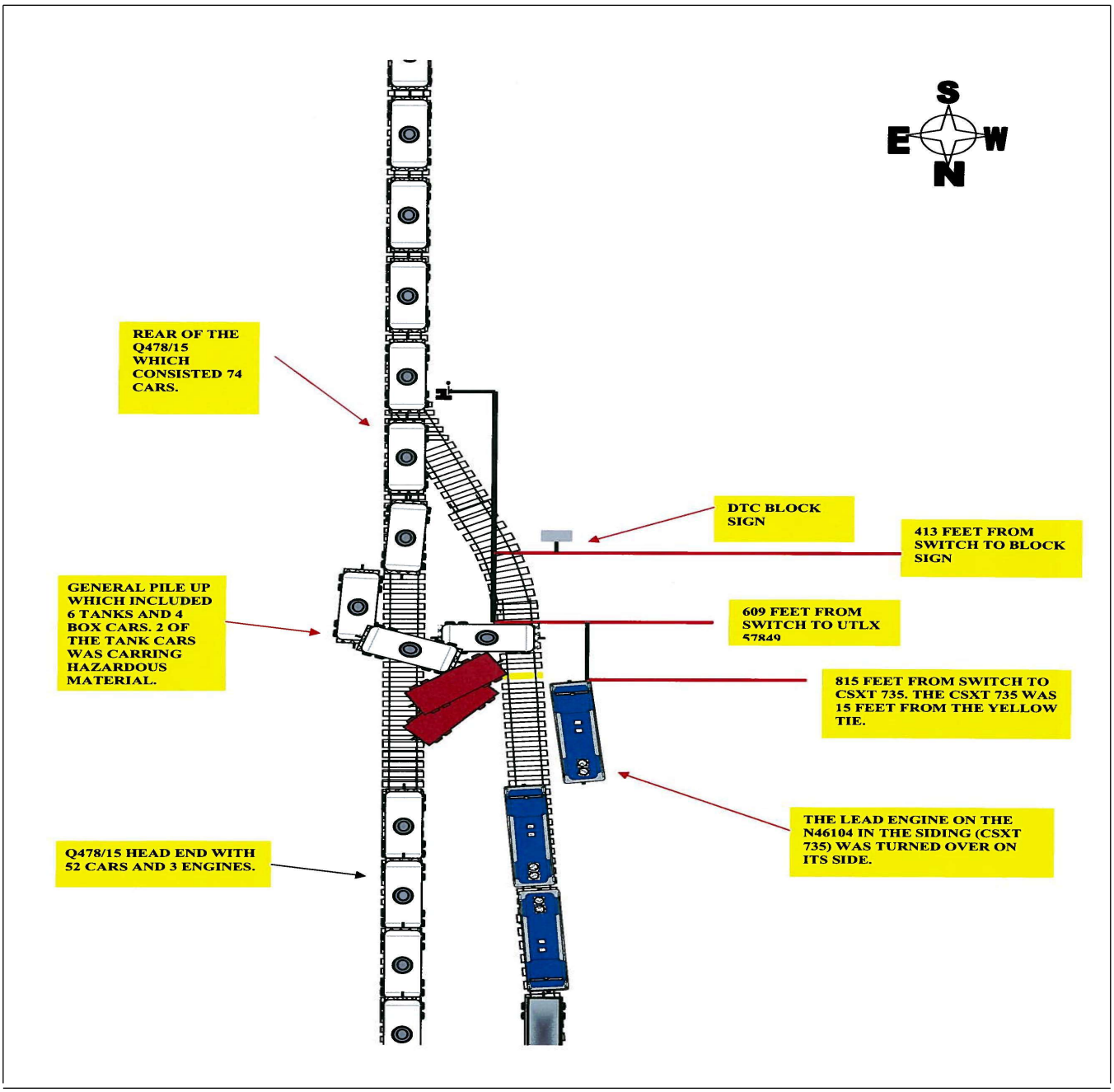
132. Locomotive Auxiliary Lights?	Code
1. Yes 2. No	N/A

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

At 7:06 a.m. on August 16, 2008 northbound CSX freight Train Q478-15 derailed at East Arcadia, North Carolina (NC). The accident occurred on the CSX Florence Division, Wilmington Subdivision at CSX Milepost (MP) SE-336.7 derailing the 53rd through the 62nd cars. The 54th car struck the lead locomotive of southbound CSX freight Train N461-04, which was standing in the siding awaiting CSX Train Q478-15 to arrive and pass. The impact caused lead Locomotive CSXT 735 of CSX Train N461-04 to turn on its west side. The recorded speed of the striking train was a recorded of 17 miles per hour (mph) at the time of impact.

The 61st car in CSX Train Q478-16 was a loaded Tank Car Number NATX 301487 containing Fuel Alcohol (Ethanol). The car was punctured in the derailment and spilled approximately 12,447 gallons of liquid. The release did not cause an evacuation, fire, or any injuries.

The locomotive engineer and conductor of CSX Train N461-04 were taken to Columbia Regional Hospital at Whiteville, NC, and treated for minor injuries and released the same day. No other injuries occurred as a result of the accident.

CSX Transportation reported $458,839 equipment damage and $45,000 track and signal damages totaling $503,839.

At the time of the accident it was daylight and clear with calm winds. The temperature was 72 ºF.

The cause of the accident was the failure of the B-end sliding center sill guide on loaded box car SOU 550515. The center sill guide is a heavy steel structure that broke from the car after the weld failed and dropped inside the track gage causing the car to derail. A poor quality weld from an unknown repair location was a contributing factor.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

CSX TRAIN N461-04

The crew of southbound CSX Train N461-04 included a locomotive engineer and a conductor. They first went on duty at 3:00 a.m. Eastern Standard Time (EST) August 16, 2008 at Davis Yard in Wilmington, NC. This is the home terminal for both crew members and they both received more than the required statutory off duty rest period prior to reporting for work.

The assigned freight train consisted of three locomotives and 100 empty coal hopper cars. It was 6,875 feet long and weighed 3,446 tons. The train was scheduled to travel to Erwin, Tennessee (TN) with no rail car set -outs or pick-ups en route. The train received the required pre-departure inspection and class one train air brake test by qualified mechanical inspectors and departed Davis Yard at 4:00 a.m.

At the accident area southbound CSX Train N461-04 was stopped in the Passing Track 815 feet from the south switch at East Arcadia. The engineer of CSX Train N461-04 notified the AP dispatcher that the train was in the clear and released his blocks. At this point, the locomotive engineer was seated at the controls on the west side of the leading locomotive. The conductor was standing on the ground west of the Passing Track and in front of the locomotive prepared to watch CSX Train Q478-15 pass by. The trip was uneventful to this point.

CSX TRAIN Q478-15

The crew of northbound CSX Train Q478-15 included a locomotive engineer and a conductor. They first went on duty at 9:30 p.m. EST August 15, 2008 at CSX Hamlet Terminal in Hamlet, NC. This is the home terminal for both crew members and they received more than the required statutory off duty period prior to reporting for work.

The assigned freight train consisted of three locomotives, 75 loaded cars and 63 empty cars of mixed freight. It was 8,154 feet long and weighed 10,990 tons. The train was scheduled to travel to Wilmington, NC with one planned rail car set-out at Acme, NC. No pick-ups were scheduled en route. The train received the required pre-departure inspection and class one train air brake test by qualified mechanical inspectors and departed Hamlet Terminal at 11:30 p.m.

As northbound CSX Train Q478-15 approached the accident area the locomotive engineer was seated at the controls on the east side of the leading locomotive. The conductor was seated on the west side of the leading locomotive. The trip was uneventful to this point.

In the East Arcadia area, MP SE-336.7, the timetable speed for the Main Track is 40 mph and the track is tangent in both directions for more than five miles. Approaching the south switch to the Pass Track at East Arcadia there is a -0.05 descending grade.

The railroad timetable direction of the train was north. The geographic direction was east. Timetable directions are used throughout this report.

RAIL CAR SOU 550516

The failed component on rail car SOU 550516, which eventually caused the train derailment, would have been inspected during two separate inspections prior to departing Hamlet Terminal. Car SOU 550516 was a loaded box car that arrived on inbound CSX Train Q477-14 at Hamlet Terminal on August 14, 2008. This car received an inspection by designated inspectors and was humped and placed in outbound CSX Train Q478-15. This car was again inspected during the Class 1 train air brake test on August 15, 2008, from 7:25 p.m. to 10:15 p.m. by qualified mechanical inspectors. The car departed Hamlet Terminal on CSX Train Q478-15 without incident. Dragging Equipment Detectors at MP SE-304.4 and SE-324.6 were operational and no alerts broadcast to CSX Train Q478-15 as it passed.

THE ACCIDENT

CSX Train Q478-15 was operating on the Main Track at 17 mph in the number 3 throttle position with a brake pipe pressure of 90 lbs. The speed was recorded by the event recorder on the controlling locomotive, CSXT 9. CSX Train Q478-15's brake pipe pressure started to decline from 90 psi to 75 psi at 7:06 a.m. and within 22 seconds the train air brake applied an emergency application. The train traveled 1,057 feet until it came to a full stop. The sliding center sill guide of the 54th car in the train, SOU 550516, was found at MP SE-334 along with the first indication of the car being derailed. Derailed Rail Car SOU 550516 traveled 2.3 miles until it came to the passing track switch at East Arcadia where it turned sideways and caused a general pile up of the 53rd through 62nd cars in the train about 610 feet from the switch. During the derailment rail car SOU 550516 struck lead Locomotive CSXT 735 of CSX Train N461-04 while it was standing in the Passing Track, causing it to roll on its west side.

Rail Car NATX 301487, a loaded tank car, was punctured during the derailment spilling some product and requiring the remaining product to be trans-loaded to another container.

At 7:00 a.m. the crew of CSX Train N461-04 was in position to inspect CSX Train Q478-15 as it rolled by. The conductor on the ground heard CS Train Q478-15's emergency train air brake application and noticed cars beginning to derail as the train traversed the switch. The conductor witnessed rail car SOU 550516 turned sideways and moving toward him from about 500 feet away. He then turned and ran in a westerly direction to get in the clear of the derailing freight cars. In the process of trying to escape he had to jump a drainage ditch on the west side of the right-of-way and sprained his knee.

During this same time the locomotive engineer saw the cars derailing and exited the rear door from the cab of the locomotive. The engineer jumped from the right rear platform to the ground and ran in a westerly direction to clear the derailing cars. The engineer sustained minor neck strains and abrasions.

ANALYSIS:

Track inspections were performed jointly by Federal Railroad Administration (FRA) Inspectors and railroad representatives with no defects noted.

Joint mechanical inspections were performed by FRA inspectors and railroad representatives on the freight cars of CSX Train Q47-15. The team found the 54th head car, SOU 550516, missing the B-end sliding center sill guide. The missing sliding center sill guide was found 2.3 miles south of the derailment site at MP SE-334. This location is also the point of the derailment (POD). The sliding center sill guide was initially welded to the car body. The car was newly built in 1970 and the sliding center sill guide showed non factory repair welds of poor quality. The center sill guide is also the mounting bracket for a brake dead lever and associated brake rod. The weld on the BR side of the sill failed first and allowed the guide to drop. The sheer weight of the guide with the weight from the center sill, brake rod, and lever, in addition to the torque from the air brakes being applied and released eventually caused the catastrophic failure which led to the derailment. No other mechanical defects were noted on this car or any other cars in CSX Train Q47815.

There was no lab analysis or other simulations performed. There were no disputes to the determined cause of this derailment.

FRA post accident drug and alcohol testing was not performed to train crew members of CSX Trains Q47815 or N46104 because the accident did not meet the FRA post-accident testing for major train accidents criteria.

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 the employees involved in this accident.

PROBABLE CAUSE:

The cause of the accident was the failure of the B-end sliding center sill guide on loaded box car SOU 550515. A poor quality weld from an unknown repair location was a contributing factor.