Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-02

CSX Transportation (CSX)
Defiance, OH
January 2, 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-2009-2

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 00055943
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: CSX Transportation [CSX]	4a. Alphabetic Code: CSX	4b. Railroad Accident/Incident No.: 00055943
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 01 | Day 12 | Year 2009	7. Time of Accident/Incident: 07:25:00 ☑ 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
18	10	N/A	0	Chicago

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Defiance	BI90.2	N/A	OH	DEFIANCE

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
19 F	4	6	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
#1 Main	4	117	4

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	Q38110

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?
44 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)*: 3132

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)*	CSXT 8367	1	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

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	2	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	65	0	0
(2) Total Derailed	5	0	23	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$949,386.00	$95,000.00	T111	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 4 Mi 50	Hrs 4 Mi 50

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
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?
N/A 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)*	N/A	N/A	N/A
(2) Causing *(if mechanical cause reported)*	N/A	N/A	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	63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	N/A	N/A	N/A	N/A	N/A	(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	(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

64. Equipment Damage This Consist N/A

65. Track, Signal, Way, & Structure Damage N/A

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
N/A	N/A	N/A	N/A

Length of Time on Duty

72. Engineer/Operator Hrs N/A Mi N/A

73. Conductor Hrs N/A Mi N/A

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

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 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	90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	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 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	117. Whistle Ban 1. Yes 2. No 3. Unknown	Code
Code(s) N/A N/A 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

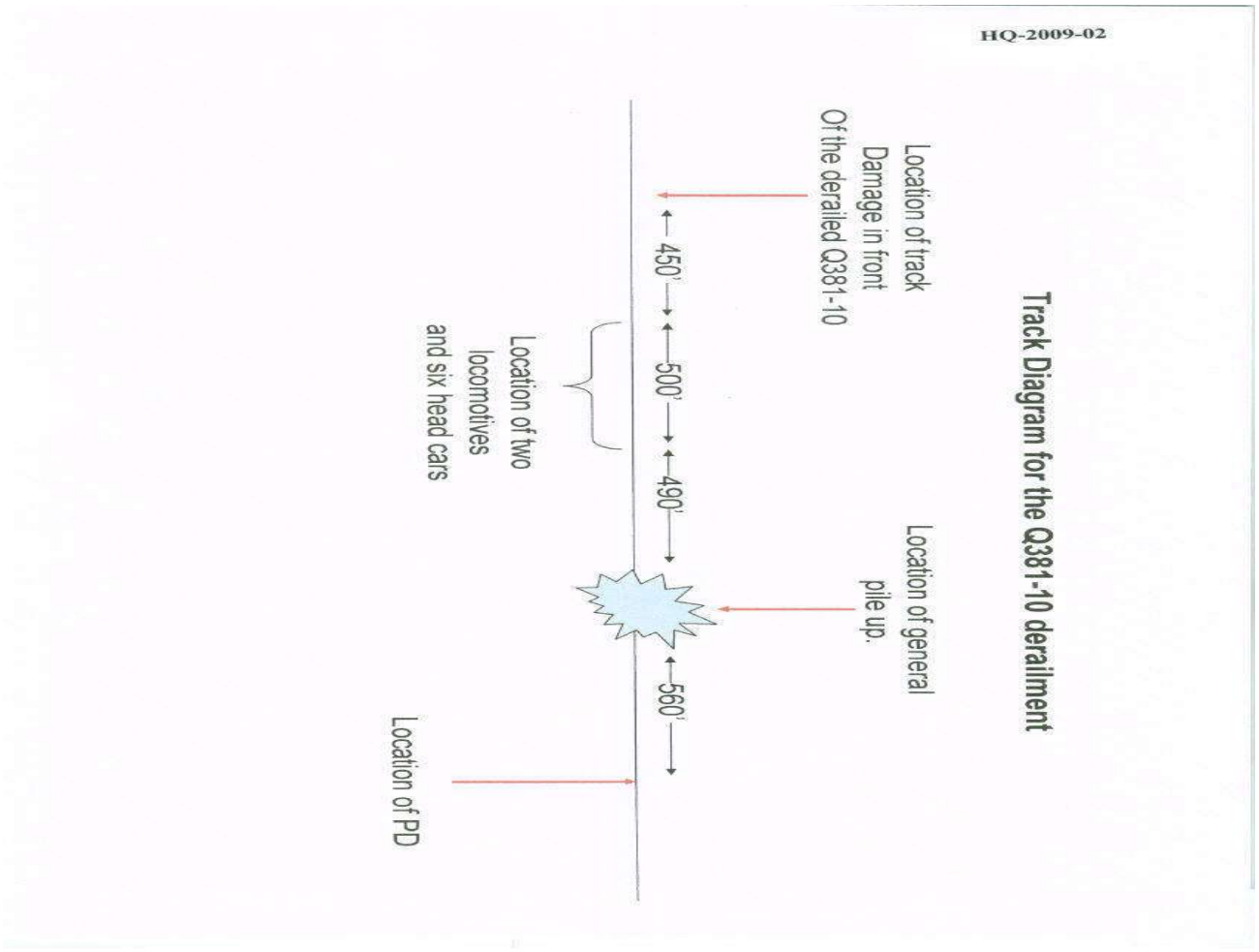
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify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

A westbound CSX freight train derailed on the Main Track at approximately 7:25 a.m, EST, January 12, 2009. The derailment occurred on the CSX Chicago Division, Garrett Subdivision on No. 1 Main Track at CSX milepost BI90.2. The derailment occurred in a rural farming area between the communities of Defiance, OH and Sherwood, OH in Defiance County. There were no injuries sustained by the train crew and no spill of hazardous materials.

Locomotive damage was assessed at $1400 with rail car damage set at $947,986 and track damage amounting to $95,000. No signal damage occurred.

FRA Post Accident Testing of employees was not applicable in this accident.

At the time of the accident, the train was traveling at 44 miles per hour. It was dark and foggy with approximately one inch of snow on the ground. The temperature was 19 degrees Fahrenheit and the wind speed was 0 mph.

The accident was caused by a lack of proper rail securement around a joint and beyond in the general area of Milepost BI90.2; the Cause Code is T111 - Wide Gage (spikes or other rail fasteners).

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

TRAIN CSX Q381-10 WEST

The crew on westward Train CSX Q381-10 consisted of a locomotive engineer and a conductor. The crew first went on duty at 2:35 a.m. EST, January 12, 2009, at the CSX Willard Terminal in Willard, OH. This is the home terminal for the crew members and both received more than the required statutory off-duty rest period prior to reporting for duty. Prior to reporting for duty, the engineer had a rest period of 44 hours and 41 minutes. The conductor was off on rest for 38 hours and 45 minutes. The engineer has 32 years of railroad experience with 15 years being in engine service. During the interview process, the engineer had her engineer certificate available and it was up-to-date. The conductor has 5 years of rail service.

CSX Train Q381-10 was a mixed freight train consisting of two locomotives, 7 loaded rail cars, and 65 empty rail cars. CSX Train Q381-10 was 4,583 feet in length with 3,132 trailing tons. Eighteen railcars contained hazardous materials. This train was originally the pick-up of an inbound train. However, the inbound crew reported experiencing problems east of Willard, OH. As a result, the inbound cars on CSX Train Q381-10 were held at Willard Terminal. After the outbound crew completed a new class 1 air brake test, an initial terminal inspection was performed. The rear-end portion of the two-way end-of-train device (EOTD) was also tested and armed at Willard Terminal. The crew of westward CSX Train Q381-10 departed Willard Terminal at 4:34 a.m. with the two locomotives arriving on inbound Q381-10 handling a 72 car train built at Willard Terminal.

As the westbound train approached the accident area, the locomotive engineer was seated at the controls on the north side of the leading the locomotive. The conductor was seated on the south side of the leading locomotive. The train was traveling at 44 miles per hour. The maximum authorized speed is 50 mph as designated in the current CSX Timetable No. 2.

In this area of the railroad, there is tangent track followed by a 1-degree curve to the right of about 700 feet to

the point of derailment (POD) at exit (west spiral) of curve. Traveling east to west, the grade is practically level.

The railroad timetable direction of the train is west. The geographic direction is west. Timetable directions are used throughout this report.

THE ACCIDENT

CSX Train Q381-10 was operating westbound negotiating the exit (west) end spiral of a 1-degree right hand curve at milepost BI90.2. The crew stated they felt the locomotive dip and sway. Next, the crew stated the train experienced an undesired emergency application of the train air brake system. According to the engineer, she looked into the side mirror of the lead locomotive and observed cars derailing accompanied by sparks and fire. After the train stopped, the crew members announced emergency over the radio and contacted the dispatcher to report the derailment.

In the aftermath of the derailment, the two locomotives and six head cars remained coupled with the lead locomotive stopping approximately 990 feet east of the general pile up of 24 derailed, blocking Main Tracks 1 and 2.

CAR DAMAGE

Twenty three loaded rail cars and five empty cars derailed. Ten of sixteen residue tank cars derailed in positions 10-19 from the head end. Two of these derailed tank cars were breached. Damage to rail cars totaled $947,986.

LOCOMOTIVE DAMAGE

The lead locomotive, CSXT 8367, was built by Electro-Motive Division in 1970, a designated Model SD40-2. The trailing locomotive, CSXT 8566, was built by Electro-Motive Division in 1984, a designated Model SD50. Both locomotives are equipped with three axle trucks so designed that the entire weight of the locomotives is concentrated directly over the center axles of the trucks. Both locomotives derailed. Wheel RL 6 was derailed on lead locomotive CSXT 8367 and wheels RL 123456 were derailed on trailing locomotive CSXT 8566. Damage to locomotive CSXT 8367 was $200 and $1200 was the amount assessed for damage to CSXT 8566.

ANALYSIS AND CONCLUSION

ANALYSIS - LOCOMOTIVE INSPECTION

An inspection of CSXT 8367 and CSXT 8566 was conducted by an FRA Motive Power & Equipment Safety Inspector (MP&E) and CSXT Mechanical Department personnel. No mechanical defects or conditions that could have caused the derailment were discovered. The automatic and independent air brakes on both locomotives were applied and released properly during testing. Reviews of the 92-day locomotive inspection documents and the daily locomotive inspection documents were current.

CONCLUSION - The locomotives condition was not a factor in this accident.

ANALYSIS - OPERATING RULES & TRAINING

Carrier records indicate that the engineer and conductor on CSX Train Q381-10 received the following training in 2008: Operating Rules, Safety-Red Zone, Securing Equipment, Power Brake Law, Hazardous-Materials, Operation Hydration-Summer Spike and Severe Winter Weather Training. Locomotive engineer certificates, hearing & vision testing, driver license checks, and other training were in compliance with 49CFR Rule 240.

CONCLUSION - Operating Rules and training were not a factor in the accident.

EMPLOYEE WORK RECORDS & DISCIPLINE

A review of Carrier records reflects the engineer on CSX Train Q381-10 has 32 years of service with 15 years being in engine service. There are four incidents of discipline in this engineer's file beginning May 6, 2001. The conductor has 5 years of service with no discipline noted in his record.

EFFECIENCY TESTING

A review of 57 efficiency tests conducted involving the locomotive engineer of CSX Train Q381-10 between January 4, 2008, and December 20, 2008, indicate one rule infraction - General Rule A-1. Reviews of 22 efficiency tests conducted on the conductor of CSX Train Q381-10 for the same time period indicate no rule infractions.

EFFECIENCY TESTING IN THE VICINITY OF THE DERAILMENT

A review of efficiency tests conducted by CSX supervisors between milepost BI85 and BI95 for the time period March 21, 2008, and December 6, 2008, indicate no rules infractions noted.

Trains operate on this section of railroad under CSX operating rules. The method of operation is Automatic Traffic Control System (ATCS). Authority for main track movement is governed by NORAC Rule 261. Cab Signal System Rules and General Signal Rules are also in effect.

Trains operate on signal indication and the maximum authorized speed for regular freight trains is 60 mph. Current CSX Equipment Handling Rules, effective October 1, 2007, has a restriction of 50 mph for freight trains handling one or more empty cars, except solid intermodal trains with empty TOFC/COFC and multilevel auto rack cars. Equipment Handling Rules also restrict a 50 mile per hour maximum speed for Unit Trains (solid loaded unit trains of coal, coke, grain, or minerals).

ANALYSIS - LOCOMOTIVE ENGINEER OPERATING PERFORMANCE

The lead locomotive on CSX Train Q381-10 was equipped with a speed indicator and an event recorder as required by Federal regulations. The relevant event recorder data was downloaded and analyzed by the CSX Roadmaster at the accident site. Event recordings documented that the locomotive throttle of CSX Train Q381-10 was in Run-6 position at the time of the derailment and was moving at a speed of 44 mph. The maximum authorized speed for CSX Train Q381-10 was 50 mph. The independent and automatic brakes were released and all functions of the two-way EOTD were operational. The dynamic brake was not in use.

CONCLUSION

Locomotive Engineer performance was not a factor in the accident.

ANALYSIS - FATIGUE

FRA obtained fatigue related information, including a 10-day work history, for the two crew members on CSX Train Q381-10 involved in this accident.

CONCLUSION

Fatigue was not evident for either of the crew members.

ANALYSIS - TOXICOLOGY TESTING

The train crew was not tested because the initial estimated cost of damage was less than $1,000,000. Also, the initial evidence at the accident scene did not indicate the actions of the train crew contributed to the accident

CONCLUSION

Drugs and alcohol were not a factor.

ANALYSIS - SIGNALS

The last signal that CSX Train Q381-10 passed prior to the derailment was the 903-1 Intermediate Signal located on the north side of Main Track No. 1 at milepost BI90.2 and approximately eight car lengths east of the derailment site. This signal location has back-to-back Safetran CLS 20 color-light signals controlled by GE Harmon ECIV Plus. The most restricting aspect the 903-1 signal can display is restricting. There are three intermediate signal locations between Defiance and the Sherwood Control Point. They have Safetran CLS 20 signals controlled by ECIV+ with coded DC track circuits.

CONCLUSION

Signals were not a contributing factor in the derailment. FRA reviewed the signal test records and conducted on-site signal testing. There was no signal damage as a result of the derailment or subsequent cleanup and track repair.

ANALYSIS - SIGNAL SYSTEM

The signal system on the Garrett Subdivision from Defiance through Sherwood, OH uses Safetran Model CLS 20 color-light type signals. Union Switch and Signal (US&S) Model M23 power switch machines, and are operated via data radio by a train dispatcher in Chicago, IL. The signals are controlled by General Electric Harmon Vital Logic Controller (VHLC) technology and General Railway Signal (GRS) plug-in-style relays. Track continuity is checked and trains are detected using GE Harmon Electro code IV+ (ECIV) coded DC track circuits between signal locations and DC track circuits within the limits of the control points. There are several hand throw switches in the area using a combination of US&S T21 or New Century type switches and General Railway Signal (GRS) Model 9 electric locks, US&S or GRS circuit controllers, and Hayes derails.

CONCLUSION

No exceptions were taken for the operation of the signal system. FRA inspections of the signal system were performed on January 14, 2009. The event log from the control machine in Chicago was reviewed and indicated that CSX Train Q381-10 received a clear signal indication at signal 903.1 All FRA testing was in compliance. The signal system operated as intended.

ANALYSIS - HOT BOX DETECTORS

Hot box detector records for CSX Train Q381-10 were reviewed and did not indicate any defects for the train.

CONCLUSION

Hot box or hot roller bearings were not a contributing factor in the derailment.

TRACK GRADE & CURVATURE PRECEDING DERAILMENT SITE

The Garrett Subdivision is tangent track with mostly 0.0% grade westward between MP BI88.2 and BI90. There is a 1-degree 15 minute right hand curve at MP BI88.2 and a 1-degree right hand curve at MP BI90.2.

ANALYSIS - TRACK INSPECTION RECORDS

A review of Carrier track inspections conducted between October 13, 2008, and January 8, 2009, revealed no major defects repaired in the immediate vicinity of the derailment other than the plant weld repaired on November 18, 2008.

A review of Carrier CWR walking joint bar inspection report reflects a total of 14 joints were inspected on Main Track #1 between mileposts BI85.1 and BI97.3 on December 29, 2008, with no exceptions noted.

There were six FRA track inspections conducted on the Garret Subdivision between March 13, 2008 and

December 10, 2008. Two of these inspections were over the subject Main Track #1 between mileposts BI87 and BI110 with no major exceptions taken.

CONCLUSION - The frequency of the track inspections and the accompanying records were not a factor in this accident.

ANALYSIS - Track - The derailment occurred on 122# curve cut rail (Bethlehem Lackawanna-rolled April 1975) in a 1-degree right hand curve with 1-1/2 inches of super elevation. Both south and north rails were seated in 14 ½ inches by 7 3/4 inches double shouldered tie plates. The point of derailment occurred on the south rail at joint bars measuring 36 inches. These joint bars connected the west end of a 29 foot installed plug rail to the parent rail. The rail plug was installed on November 18, 2008 as a result of a defective plant weld detected during a Sperry Ultra-sonic Rail test on November 18, 2008.

The joint bars were drilled with six holes; however, the joint bars were secured to the rail ends with only four bolts as the rail ends were not drilled for the two middle holes in the joint bars. The joint bar on the field side was in good condition; however, the gage side joint bar showed signs of wear on the top (west end) of the joint bar.

The anchor pattern consisted of every other tie box anchored using a standard spring type anchor. The anchors were flush against the crossties.

An on-site investigation revealed missing spikes in and beyond the area of the aforementioned joint at Milepost BI90.2. There were no spikes holding the rail down on the field side of the joint. There were no spikes holding the rail down in the immediate area of the joint on the field side. There were no spikes holding the rail on the gage side of the subject joint. The only spikes present were the anchor spikes holding the tie plate to the crosstie.

The spiking pattern required on this 60 mph Class 4 track is Spiking Pattern “C” as indicated in CSXT Engineering Department Maintenance of Way Field Manual issued November 4, 2008. This spiking pattern requires two rail holding spikes on the gage side and one rail holding spike on the gage side with one anchor spike on the field side of both the high and low side of the curve. The anchor pattern consisted of every other tie box anchored using a standard spring type anchor.

It is noted that the existence of raised track spikes (three inches) on the gage side of the north rail on Main Track #1 were observed for a distance of 450 feet ahead of the point where the lead locomotive of CSX Train Q381-10 stopped. During the on-ground inspection, these raised spikes and damage to a 36 inch joint bar (gage side) on the north rail ahead of the lead locomotive on the train initially indicated that a locomotive or rail car in the preceding westbound CSX Unit Coal Train U994-09 had derailed and then re-railed itself at the joint bar prior to the arrival of CSX Train Q381-10. As a result, CSX Train U994-09 was stopped at Gary, Indiana on the date of the incident for a detailed inspection. The inspection of CSX Train U994-09, which involved CSX Mechanical personnel and a FRA MP&E Inspector, revealed no derailment damage or derailment marks on any equipment.

CSX investigators string lined the 1-degree curve and took measurements at 15 ½ foot stations. The maximum gage measurement within 13 stations was 57 inches. The maximum elevation was 1-1/2 inches. However, at the point of derailment (PD) where the high side rail was rolled (canted) 1-1/4 inches, plus 1 inch shove to the field (south) side, the gage measured 58 ½ inches.

The point of derailment for CSX Train Q381-10 was at the south rail on the No. 1 Main Track at the rail joint bars connecting the west end of a 29 foot installed plug rail to the parent rail. This plug rail was installed on November 18, 2008 as a result of a defective plant weld detected during a Sperry Ultra-sonic Rail test on November 18, 2008. During the on-site investigation, it was determined that there were missing spikes in and beyond the area of the aforementioned joint at milepost BI90.2. The only spikes present were the anchor spikes holding the tie plate to the crosstie.

CONCLUSION - Defective track conditions were a cause of this accident due to the missing spikes found on the field side of the rail joint at milepost 190.2 at the accident scene. The missing rail spikes on the field side of the rail coupled with missing rail holding spikes on the gauge side of the joint caused the rail to spread under load conditions. The gauge was measured at the PD at 58-1/2 inches.

ANALYSIS & CONCLUSION

While traveling west on Main Track #1 between Defiance and Sherwood, OH, CSX Train Q381-10 experienced an undesired emergency application of the train air brake system resulting in the derailment of two locomotives and 28 rail cars. An investigation revealed several missing track spikes in and beyond the area of a joint on the high side of a curve at milepost BI90.2. Wheel action at the point of derailment indicated a drop inside the gage of the track, which supports the notion of wide gage.

Four westbound trains ahead of CSX Train Q381-10 operated over the derailment site between the hours of 2:45 a.m. and 6:10 a.m. on January 12, 2009 without experiencing any problems. There were fresh rail marks and a gouge in a rail joint on the north rail approximately 450 feet west of the lead locomotive of CSX Train Q381-10. However, there were no wheel flange marks on the cross ties, tie plates or rail anchors to indicate that a freight car had been derailed in a preceding train. If a locomotive or freight car had been derailed, there would be visible markings on the cross ties, tie plates and/or rail anchors.

An inspection of the last preceding westbound train (CSX Train U994-09) was conducted at the CSX Yard in Gary, IN. No derailment damage or marks were found on any equipment in CSX Train U994-09 during the inspection which involved CSX Mechanical personnel and a FRA MP&E Inspector out of Chicago, IL. During this inspection, an empty coal car (CEFX 69765) was removed from CSX Train U994-09 and taken to CSX Barr Yard Car Shop in Chicago, IL for further inspection because a wheel flange on the car showed excessive wear. There were no defective or unusual conditions found during the inspection of this car.

The train crew of CSX Train U909-04 was interviewed by CSX personnel in Gary, IN. They acknowledged that the track conditions at the point of derailment of CSX Train Q381-10 felt rough, but not significant enough to warrant notification to the train dispatcher.

The CSX Division Engineer expressed belief that a freight car in another westbound train had previously derailed and damaged the track in the accident area, which caused the derailment of CSX Train Q381-10: however, he conceded that there was no evidence found during inspections to support his theory.

PROBABLE CAUSE AND CONTRIBUTING FACTORS

FRA’s investigation concludes that the cause of derailment of CSX Train Q381-10 was wide gage.