Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-49

CSX Transportation (CSX)
Gladstone, VA
May 27, 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-2008-49

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 000047424
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.: 000047424
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 05 | Day 27 | Year 2008	7. Time of Accident/Incident: 05:45:00 ☐ 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
0	N/A	N/A	0	Huntington East

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Gladstone/Walkerford	0128.0	N/A	VA	NELSON

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
78 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
U27622	3	53.9	3

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	U27622

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

30. Trailing Tons *(gross tonnage, excluding power units)*: 15977

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)*	PMRX 1483	26	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	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	144	0	0	0	0
(2) Total Derailed	33	0	0	0	0

37. Equipment Damage — This Consist: $840,485.00

38. Track, Signal, Way, & Structure Damage: $90,000.00

39. Primary Cause Code: T207

40. Contributing Cause Code: N/A

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
2	0	1	0

Length of Time on Duty

45. Engineer/Operator: Hrs 2 Mi 0

46. Conductor: Hrs 2 Mi 0

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)* — Code: R - Recorded; E - Estimated: N/A MPH | N/A

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

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
(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

63. 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

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 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. 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

DEPARTMENT OF TRANSPORTATION
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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

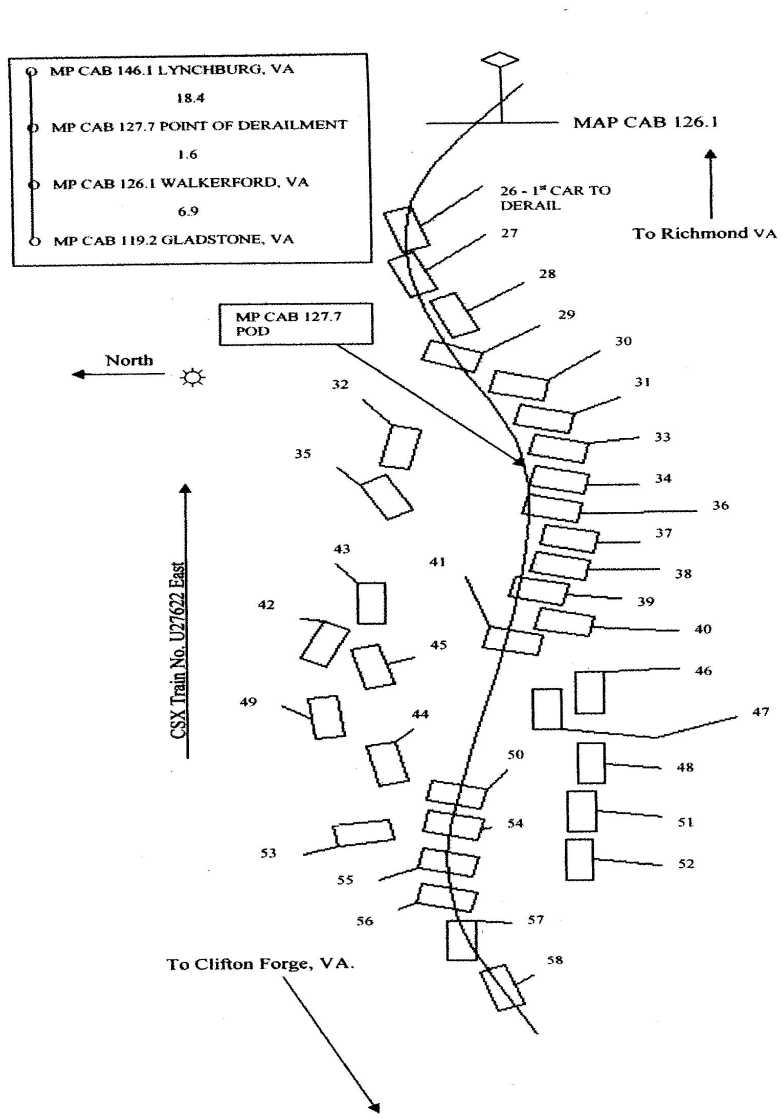
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify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



HQ-2008-49

POS	INT & CAR NUMBER	POS DERAILED
26	PMRX 1483	Pile-up
27	PMRX 1484	Pile-up
28	PMRX 1485	Pile-up
29	PMRX 1486	Pile-up
30	NDYX 951064	Pile-up
31	NYC 508712	Pile-up
32	CSXT 822659	Pile-up
33	IFRX 832	Pile-up
34	CSXT 822659	Pile-up
35	CSXT 388600	Pile-up
36	CSXT 391581	Pile-up
37	NYC 506384	Pile-up
38	CSXT 392390	Pile-up
39	CSXT 383385	Pile-up
40	CSXT 389305	Pile-up
41	CSXT 388774	Pile-up
42	CSXT 809658	Pile-up
43	PEPX 238	Pile-up
44	NYC 503961	Pile-up
45	RTPX 11329	Pile-up
46	CSXT 392963	Pile-up
47	CSXT 819006	Pile-up
48	CSXT 823023	Pile-up
49	NYC 507213	Pile-up
50	CSXT 391171	Pile-up
51	CSXT 391899	Pile-up
52	NYC 509310	Pile-up
53	NYC 497664	Pile-up
54	HLMX 589097	Pile-up
55	NYC 506746	Pile-up
56	PEPX 646	Pile-up
57	NYC 505947	Pile-up
58	NYC 503895	Pile-up

FRA Accident No. HQ-2008-49
CSX James River Subdivision
MP CAB 127.7
Gladstone, VA
5:45 PM 05/27/2008
Not to scale

137. SYNOPSIS OF THE ACCIDENT

On May 27, 2008 at 5:45 p.m. CSX Transportation (CSX) Unit Coal Train # U27622 traveling eastbound on single Main Track derailed 33 hopper cars. The accident occurred on the CSX James River Subdivision, Huntington Division East, at Walkerford, VA, at CSX Milepost CAB 127.7. The accident occurred approximately 6.9 miles from the city of Gladstone, VA located in Nelson County. The accident occurred at Walkerford, VA in Amherst County. At the time of the accident the weather was clear with no discernible wind. The temperature was 78°F. The railroad timetable direction for the train was east. The geographic direction was east. Timetable directions are used throughout this report.

The train consisted of two locomotives and 144 loaded coal hopper cars. Thirty-three loaded rail cars derailed. There were no casualties and no hazardous materials involved. No one was evacuated. Estimated damages to the equipment and track/signals were $840,485 and $90,000 respectively.

The FRA conclusion was derived during the on-site accident investigation which revealed that the probable cause of the accident was a Transverse Detail Defect (TDD) broken rail. Sperry Rail Services analyzed the broken rail and based on their analysis and laboratory test results. There was a TDD identified in the north rail at the point of derailment. The TDD rapidly propagated after the last internal rail flaw test resulting in failure of the rail. CSX agrees with the probable cause.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of eastward CSX Unit Coal Train # U27622 consisted of a certified engineer and conductor and a student engineer. The crew went on duty at 12:00 noon EST on May 27, 2008 at Clifton Forge, VA. Clifton Forge, VA is the home terminal for the crew members and all members received more than the required statutory off-duty rest period prior to reporting for duty. The crew was transported by taxi to the train and boarded the train at S D Cabin at CSX Milepost CAB 173.7.

The coal train consisted of two locomotives, CSXT 210 and CSXT 234, and 144 loaded coal hopper cars. It was equipped with an End-Of-Train Device (EOTD). The train length was 7,352 feet and had 19,351 trailing tons.

CSX Unit Coal Train # U27622 originated at Clifton Forge, VA, on May 25, 2008 and received all the FRA required inspections at this location. The CSX Mechanical Department employees performed brake tests, and the train was in full compliance with FRA regulations upon departure. The train traveled westward to the Wells Mine in Danville, West Virginia. The train was loaded with coal and remained intact while being loaded. The train crew tested the EOTD telemetry device at the Wells Mine. After loading, the train traveled eastward passing through Clifton Forge, VA. The train was stopped at S D Cabin at CSX Milepost CAB 173.7. The train was made secure, sufficient hand brakes were set, and the train remained intact. The relief train crew arrived from Clifton Forge, VA and boarded the train at S D Cabin. The train required no inspections at this location. There were no plans to add or remove cars during the trip.

At S D Cabin the train departed eastward at about 3:30 p.m. on single Main Track en route to Richmond, Virginia.

As the eastbound train approached the accident area, the student engineer was seated at the controls on the north side of the lead locomotive. The conductor was seated on the south side, and the engineer was seated in the center of the cab of the leading locomotive. The locomotive was being operated with the short hood

forward.

Approaching the accident site from the west, starting at Milepost CAB 129 and traveling eastward on single Main Track there is 375 feet of tangent track with 0.0% (level) grade. Beyond that end of this tangent segment there is a 3-degree 0-minute right hand compound curve with 1-inch super-elevation; 2-degree 30-minute 0.75-inch super-elevation; and 4-degree 0 minute 2-inch super-elevation. This compound curve is 1,875 feet long leading to 375 feet of tangent track with 0.0% (level) grade. Continuing east there is another 6 -degree 15-minute right hand compound curve with 3.5 inches super-elevation; 2-degree 15-minute 0.5-inch elevation; and 6-degree 0-minute 3.5 inches elevation. At the east end of this curve at milepost CAB 128.2 on tangent track the grade is descending 0.64% for 300 feet then changing to 0.11% descending grade for 1,500 feet to milepost CAB 127.7. At CAB 127.7 (point of derailment) there is a 4-degree 22-minute left hand 562-foot curve on descending grade of 0.19 onto tangent for another 150 feet. Grade changes from 0.11% to 0.0% (level) on tangent track over the next 1,200 feet. Note, curve hand (right/left) and grade (plus/minus) as described above are from the perspective of the operating compartment of the involved train (opposite the engineering track chart). The track was constructed with a ballast section of granite stone, 136 lb RE rail fastened by Pandrol™ clips on concrete ties spaced on 2 foot center-to-center spacing.

The head end and rear of the train was on level track while the middle of the train was on a descending grade. The point of derailment was in the full body of the 4-degree 22-minute left hand curve at milepost CAB 127.7. The cause of the derailment was the sudden break of the north (outside) rail of the curve. This rail was 136-lb Steelton, rolled in 1996, exact month unknown due to location of break (possibly June or later). The stamp number is 09224-4-P50 and installed in 1997 (the “P” designation indicates this is a rail manufactured by the continuous casting process).

CSX train crew of CSX Train # U27622 was operating in compliance with FRA and CSX operating rules and regulations. The FRA conclusion was derived from on-site accident investigation and CSX Operating Rules, CSX Track Safety Standards, and CSX Mechanical Department Standards.

THE ACCIDENT

CSX Unit Coal Train # U27622 was being operated on single Main Track at 30 mph approaching the accident area. At the time the accident occurred the train was being operated at 29 MPH. Both speeds were recorded by the event recorder on the controlling locomotive. According to the event recorder, the student engineer was operating the train in the number 6 throttle position. The maximum authorized speed for freight trains is 35 mph as designated in the current CSX Huntington Division East, Timetable # 1, which was effective Saturday, January 1, 2005. The student engineer in his statement stated that he felt a bump and then the train experienced an emergency application of the train air brakes. The student engineer announced over the radio that the train was in emergency.

The conductor detrained and walked westward inspecting the train. He discovered the 26th car through the 59th car derailed. The cars were in a general pile-up with heavy damage to the equipment. He called the engineer and informed him of the derailment. The engineer notified the dispatcher and CSX officials of the derailment. A CSX trainmaster arrived at the scene.

The FRA Inspectors and CSX officials discovered the Point of Derailment (POD) at CSX Milepost CAB 127.7. Further investigation revealed a broken north rail. The first car to derail was PMRX # 1483, hopper car loaded with coal.

FRA took no exceptions with the track conditions, equipment, or train handling. FRA conducted an inspection of the derailed cars and remaining cars in the train; no exceptions were taken.

ANALYSIS AND CONCLUSIONS

ANALYSIS - TRACK:

The James River subdivision is FRA Class 3 track with a maximum timetable speed of 35 mph, with no passenger trains. The loading consists of approximately 53.9 million gross tons with most trains being loaded coal trains in the east direction with empty trains in the west direction. The FRA Track Safety Standards (TSS), § 213.233, for this track shall be conducted at least once every 30 million gross tons (MGT) or once a

year, whichever interval is longer. On May 1, 2008 Sperry Rail Service tested the James River Subdivision between milepost CAB 154.25 and milepost CAB 119.20. No rail defects were noted in the derailment area on the May 1 test, but the Sperry test on December 13, 2007 revealed two Transverse Detail Defects. A TDD of 20% was discovered at milepost CAB 127.7681 and a TDD of 10% at milepost CAB 127.7623. The defective rails were replaced that same day with CSX "certified" 136 lb plug rails installed end to end creating three rail joints.

* As defined by CSX, a "Certified Repair Rail" is a rail removed with less than 5 MGT from last rail test may be certified by a Qualified Inspector designated by Asst. Chief Engineer-Inspection Process Engineering, provided:

1) No visual defects are detected, per Standard Drawing 2503,
2) Latest Rail Test Vehicle report indicates rail is defect-free
3) Tonnage since last rail test is 5 MGT or less. The Qualified Inspector then tags rail as certified.

The James River Subdivision rail was ground to restore railhead contour in February 2008. The CSX geometry car inspected the James River Subdivision on May 2, 2008 with no defects found in the derailment area. On May 26, 2008 a CSX track inspector performed a hi-rail inspection of this track with no defects noted in the area of the derailment.

On May 27, 2008, the day of the derailment, CSX welders made three welds to connect the two plug rails to the parent rail. The welders stated that the welds were made in accordance with CSX welding standards and the welding report was completed and filed at the local Road master's office. To weld the rail ends together, they had to cut the rail at the temporary bolted joints to create a gap of 1" to 1-1/8" in order to cast the welds. The welders stated that the reference marks placed on the plugs when installed were no longer visible. The track disturbance report made as the plug rails installed indicate that no rail was added. At the time of welding, the rail temperature was acceptably over the 95-degree minimum neutral temperature desired by CSX in the State of Virginia. The rail temperature was 98 degrees for the first weld, 105 degrees the second weld, and 108 degrees for the third weld. The welders stated that the rail did not move when the welders removed the Pandrol ™ clips from four railroad ties each side of the joint which was done to line up the rail ends. The welding material used was supplied by the Boutet Company in Napoleon, Ohio. After the welds were completed the track was released to rail traffic with no speed restriction. The point of derailment was near the location of the third and last weld made.

On the parent rail at the TDD there were 7/16 inches of head (horizontal) wear on the gage corner and 5/16 inches of head (vertical) wear on the top. Sperry Rail Services conducted a post-accident off-site laboratory metallurgical and mechanical wear pattern examination of 73-inches of this rail containing two TDD defects. The rail flaws found and shown in the attached photograph were 20% normal growth to 30% sudden growth detail fracture in the railhead. The Sperry Rail Service has provided a print of the detector car test data showing a 12 foot section of the north rail, high rail that broke causing the derailment.

The Sperry Rail test data confirms the equipment was functioning properly and responding to known reflectors associated with track construction such as drilling rail-ends, and railhead surface anomalies that are present in the immediate vicinity.

The test operator interpreted the equipment response from the detector car and determined further action was warranted to confirm the presence of a railhead surface condition. In this instance, the test car stopped, backed up to the suspected location, and visually confirmed that the severity of the surface condition was sufficient to account for the equipment response.

The investigation confirmed no equipment response was present within the prescribed measurement that would suggest the presence of a well-developed pre-existing transverse component at the time of the test. It is possible that the internal rail flaw was at a borderline detection size of 10% cross section area of the railhead, 26 days prior to the derailment. Cross section defects 10% or less in size discontinuity in the railhead is generally not detectable.

The FRA Track Inspector performed a one mile walking inspection of the track over which the train had traveled. The FRA inspector took no exceptions. The track inspector reviewed the CSX records for

1) Three Year Rail Defect History.
2) James River Sub CAB 127.5 Gems Report.

3) James River Sub Cab 126-132 TGC-2 PR1 Exception Report 5-02-2008.
4) James River Sub CAB 126-132 TGC-2 Exception Report 5-02 and
5) James River CAB 127.5 Track Chart. After careful review of the records and evaluating the data with the R2 Regional Staff, the FRA determined that the CSX was in compliance the FRA regulations 49 CFR Track Safety Standards Part 213.

CONCLUSION:

FRA reviewed the Sperry Rail test data from the May 1, 2008 inspection and determined the CSX is in full compliance with the Track Safety Standards including Title 49 CFR, Part 213 Subpart B, Sec.213.237, inspection of rail (see attachment Sperry Rail Service Records). Based on the foregoing, the probable cause of the accident was the TDD that rapidly propagated after the last internal rail flaw rail test.

ANALYSIS - EQUIPMENT:

The FRA Motive Power and Equipment (MP&E) Inspector performed an inspection of the derailed equipment and the remainder of the cars in the train. A careful inspection was conducted of the trucks, wheels, roller bearings, center sill, and draft arrangements. The locomotives were inspected, and no exceptions were taken.

CONCLUSION:

After evaluating the inspection results and conversing with the R2 Regional Staff, it was determined that the CSX was in full compliance with the FRA Regulations and CSX rules. The FRA and CSX Officials agreed that the damage to the equipment occurred as a result of the derailment.

ANALYSIS - TOXICOLOGICAL TESTING:

There was no toxicological testing performed on the train crew. The FRA Operating Practices Inspector and CSX Officials determined that toxicological testing was not required.

CONCLUSION:

Alcohol and drug use was not a factor. The FRA Operating Practice (OP) Inspector working closely with the R2 Regional Staff determined that the accident data required no toxicological test. FRA determined that the CSX was in full compliance with 49 CFR Part 219 Control of Alcohol and Drug Use.

ANALYSIS - LOCOMOTIVE ENGINEER OPERATING PERFORMANCE:

The locomotive was equipped with a speed indicator and event recorder as required. The student engineer was operating the train at a recorded speed of 29 mph. The relevant event recorder was downloaded by the CSX Road Foreman at the accident site and analyzed at the CSX locomotive facility at Huntington, WV. The FRA Inspectors obtained a copy of the download and reviewed the results with the R2 Regional Staff.

CONCLUSION:

The student locomotive engineer was in compliance with all applicable railroad operating rules and train handling rules. After reviewing the download and accident data, the FRA is in agreement with the CSX officials that the student engineer was operating the train in full compliance with FRA Regulations and CSX Operating Rules.

ANALYSIS: - FATIGUE

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.

OVERALL CONCLUSION:

The FRA conclusion was formed during the on-site accident investigation. During the course of the accident investigation, it was discovered that the north rail was broken. The download data from the event recorder indicated that the student engineer was operating the train in compliance with CSX Timetable and Operating Rules. No exceptions were discovered with the track, equipment or train handling. Statements from the train crew indicate what happened with the train prior to the derailment and after the derailment. Also, the crew statements revealed the actions of the crew. FRA Inspectors were on conference calls with the R2 Region Regional Staff to analyze and evaluate the accident data.

The FRA and CSX Railroad Officials agree that the probable cause of the accident was a TDD in the north rail. The TDD resulted in the failure of the north rail. The FRA accident investigation and Sperry Rail Service test data determined the probable cause of the accident was a TDD in the north rail. The Sperry Rail Service verified a TDD in the rail. The laboratory test results revealed that the TDD rapidly propagated after the last internal rail flaw test, resulting in the failure of the north rail. The train crew witnessed the accident, and the FRA used their statements during the accident investigation. According to the FRA Guide for Preparing Accident/Incident Reports, the primary cause code T207 was used in this report.