Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-14

CSX Transportation (CSX)
Laurens, South Carolina
March 17, 2006

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-2006-14

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 000021190
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident: N/A
3.Name of Railroad Responsible for Track Maintenance: CSX Transportation [CSX]	3a. Alphabetic Code: CSX	3b. Railroad Accident/Incident No.: 000021190
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident: Month 03 / Day 17 / Year 2006	6. Time of Accident/Incident: 02:35: ☐ AM ☑ PM

7. 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)*: 09

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
0	0	0	0	Florence

13. Nearest City/Town	14. Milepost *(to nearest tenth)*	15. State Abbr	15. State Code	16. County
Laurens	AK554.9	N/A	SC	LAURENS

17. Temperature (F) *(specify if minus)*	18. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark	Code	19. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow	Code	20. Type of Track 1. Main 2. Yard 3. Siding 4. Industry	Code
62 F		2		1		1

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density *(gross tons in millions)*	24. Time Table Direction 1. North 2. South 3. East 4. West	Code
single main		3	34		2

OPERATING TRAIN #1

25. 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	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
	8	1. Yes	1	F224-17

28. Speed *(recorded speed, if available)* R - Recorded E - Estimated			Code
	20	MPH	R

29. Trailing Tons *(gross tonnage, excluding power units)*: N/A

30. 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)				
k	N/A	N/A	N/A	N/A

30a. 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

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	N/A	1	no
(2) Causing *(if mechanical cause reported)*	0	0	N/A

32. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
0	N/A

33. Was this consist transporting passengers? (Y/N): N/A

34. 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	1	0	0	0	0
(2) Total Derailed	0	0	0	0	0

35. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
$500.00	$0.00	H404	N/A

Number of Crew Members				Length of Time on Duty	
40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen	44. Engineer/Operator	45. Conductor
1	0	1	0	Hrs 8 Mi 35	Hrs 8 Mi 35

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	0

49. EOT Device? 1. Yes 2. No: 2

50. Was EOT Device Properly Armed? 1. Yes 2. No: N/A

51. Caboose Occupied by Crew? 1. Yes 2. No: 2

OPERATING TRAIN #2

52. 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	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
	9	1. Yes	2	N/A

55. Speed *(recorded speed, if available)* R - Recorded E - Estimated			Code
	0	MPH	R

57. 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

57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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56. Trailing Tons *(gross tonnage, excluding power units)*	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)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
N/A			k N/A N/A N/A N/A	0

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*	59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First involved *(derailed, struck, etc)*	OTE75281	1	no		N/A	N/A
(2) Causing *(if mechanical cause reported)*	0	0	N/A	60. Was this consist transporting passengers? (Y/N)	N/A	

61. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote	62. 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

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
$0.00	$0.00	N/A	N/A

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen	71. Engineer/Operator	72. Conductor
0	0	0	0	Hrs 0 Mi 0	Hrs 0 Mi 0

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

76. EOT Device?	77. Was EOT Device Properly Armed?	78. Caboose Occupied by Crew?
1. Yes 2. No N/A	1. Yes 2. No N/A	1. Yes 2. No N/A

Highway User Involved

79. Type — Code: N/A
C. Truck-Trailer. F. Bus J. Other Motor Vehicle
A. Auto D. Pick-Up Truck G. School Bus K. Pedestrian
B. Truck E. Van H. Motorcycle M. Other *(spec. in narrative)*

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

81. Direction *(geographical)* — Code: N/A
1.North 2.South 3.East 4.West

82. Position — Code: N/A
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing
4. Trapped

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

83. Equipment — Code: N/A
1.Train *(units pulling)* 3.Train *(standing)* 6.Light Loco(s) *(moving)*
2.Train *(units pushing)* 4.Car(s) *(moving)* 7.Light(s) *(standing)*
5.Car(s) *(standing)* 8.Other *(specify in narrative)*

84. Position of Car Unit in Train: N/A

85. Circumstance — Code: N/A
1. Rail Equipment Struck Highway User
2. Rail Equipment Struck by Highway User

86b. Was there a hazardous materials release by — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

86c. State here the name and quantity of the hazardous materials released, if any.
N/A

87. Type of 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

Code(s)							
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

88. Signaled Crossing Warning *(See instructions for codes)* — Code: N/A

89. Whistle Ban — Code: N/A
1. Yes
2. No
3. Unknown

90. Location of Warning — Code: N/A
1. Both Sides
2. Side of Vehicle Approach
3. Opposite Side of Vehicle Approach

91. Crossing Warning Interconnected with Highway Signals — Code: N/A
1. Yes
2. No
3. Unknown

92. Crossing Illuminated by Street Lights or Special Lights — Code: N/A
1. Yes
2. No
3. Unknown

93. Driver's Age: N/A

94. Driver's Gender — Code: N/A
1. Male
2. Female

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code: N/A
1. Yes 2. No 3. Unknown

96. Driver — Code: N/A
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)*

97. Driver Passed Standing Highway Vehicle — Code: N/A
1. Yes 2. No 3. Unknown

98. View of Track Obscured by *(primary obstruction)* — Code: N/A
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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	N/A	N/A

99. Driver Was — Code: N/A
1. Killed 2.Injured 3. Uninjured

100. Was Driver in the Vehicle? — Code: N/A
1. Yes 2. No

102. Highway Vehicle Property Damage *(est. dollar damage)*: N/A

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

104. Locomotive Auxiliary Lights? — Code: N/A
1. Yes 2. No

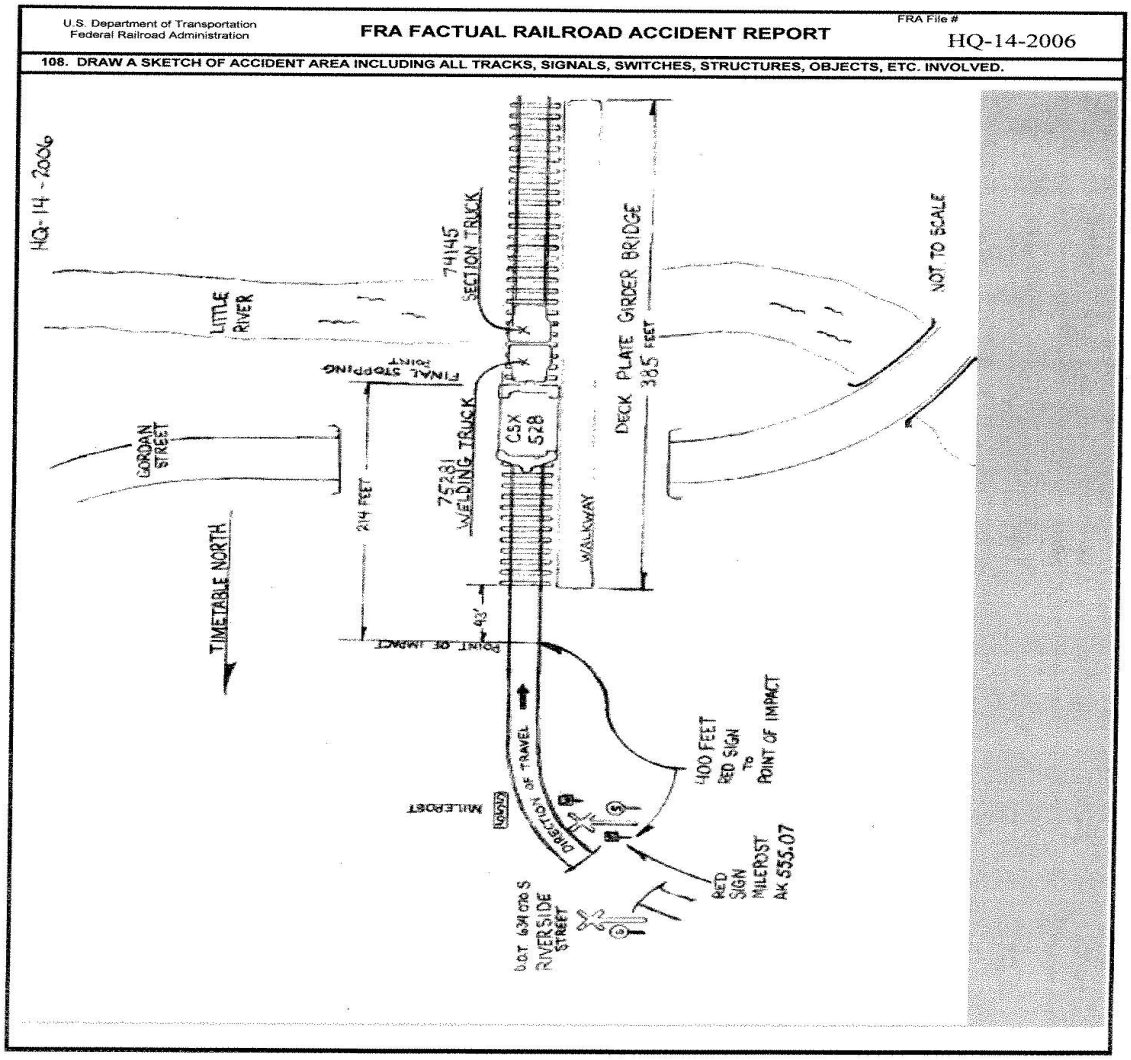
105. Locomotive Auxiliary Lights Operational? — Code: N/A
1. Yes 2. No

106. Locomotive Headlight Illuminated? — Code: N/A
1. Yes 2. No

107. Locomotive Audible Warning Sounded? — Code: N/A
1. Yes 2. No

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

HQ-14-2006 sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

On March 17, 2006, at 2:35 p.m. EST, CSX Train No. F224-17, operating as a light locomotive in a southward direction on the CSX Spartanburg Subdivision, struck a CSX Maintenance-of-Way (MofW) hi-rail vehicle and pushed it into a second MofW vehicle at milepost (MP) AK554.9. The accident ocurred in Laurens, South Carolina (SC) on a single Main Track on the approach to a thru girder deck plate bridge. The accident included one locomotive and two MofW vehicles. None of the equipment derailed. One MofW vehicle was completely destroyed, and the second vehicle sustained moderate damage. The locomotive sustained minor damage.

There were no injuries and no evacuation ordered. Equipment damages totaled $100,500. The weather at the time of the accident was daylight, clear and 62°F.

The cause of the accident is the failure of the engineer and conductor of CSX Train F224-17 to stop at the Irby Block Sign. In addition, the train crew failed to stop at the Form W Limits conditional stop sign placed at MP AK555.07 by the CSX MofW foreman.

110. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

CSX TRAIN F224-17

The crew of CSX F224-17 included a locomotive engineer and a conductor. They went on duty at 6:00 a.m. March 17, 2006, at the CSX Spartanburg Yard in Spartanburg, SC. This is the home terminal for both crew members and both received more than the required statutory off duty time. They were assigned to operate CSX Locomotive # 528, which would be used as helper locomotive power for trains operating between Spartanburg and Hunter Junction. Following a job briefing and locomotive inspection, Locomotive # 528 coupled to the rear of CSX Train N130-14, a loaded coal train. CSX Train N130-14 completed a terminal train air brake test and received authority from the train dispatcher to occupy the Arkwright and Roebuck Blocks, and departed CSX Spartanburg Yard at 8:45 a.m.

The train stopped at the south Roebuck Block Sign, six miles south of Spartanburg to meet and pass opposing rail traffic. At 11:52 a.m., the crew received permission to occupy the Tyger Block and proceded southward toward Hunter Junction. At 12:50 p.m., CSX Train N130-14 stopped at Hunter Junction to allow Locomotive # 528 to uncouple and receive authority to operate as CSX Train F224-17 in the Hunter Block, jointly with CSX Train N130-14. CSX Train N130-14 continued southward on the Spartanburg Subdivision to the CN&L Subdivision. At 2:18 p.m., CSX Train F224-17 received an authority for the Hunter and Laurens Blocks to proceed south to MP AK552.2, where the Irby Block begins. Both crew members stated in the "Report of Interview" that they were aware and familiar with the 707 in effect ahead of them. This was the last conversation between the dispatcher and CSX Train F224-17 prior to the collision.

As CSX Train F224-17 traveled south, the locomotive engineer was seated at the controls on the east side of the locomotive and the conductor was seated on the west side. The locomotive was being operated with the long nose end facing southward.

Approaching the accident site from MP AK555.4 there is tangent track for 1,000 ft., leading into a 6-degree, 22-minute left hand curve. This is followed by 240 ft. of tangent track at the north end of a thru girder deck plate bridge and continues over the bridge. The grade between MP AK555.4 and AK554.9 is a 1.65-percent descending grade. The Irby Block Sign is located at MP AK555.2 on the east side of the track, 105 ft. south of the Flemming Street public road crossing. The sight distance around the curve is obscured by large trees and vegetation growing on both sides of the track; however train crew members acknowledged that excess vegetation was not an issue and did not obscure their vision in observing the advance 707 warning signs placed by the MofW employees. A second public road crossing, Riverside Street, crosses the track at MP AK555.07 and is in the curve.

MAINTENANCE OF WAY CREWS:

The MofW crew at Laurens included a foreman, a machine operator, and two trackmen. The welding crew consisted of a welder and a welder helper. They went on duty at 7:00 a.m., March 17, 2006, at the CSX MofW headquarters in Laurens. The planned work for both crews was to repair internal rail defects identified by the Sperry Rail Service Test Truck No. 952 on the previous day.

At 7:42 a.m. the foreman of the section crew verified with the dispatcher that their on-track protection, CSX Rule 707, Form W-Conditional Stop was in effect. The Form W limits were within the Irby Block, between MP AK547.6 and AK555.0. Following a job briefing, the two crews went to MP AK 549.8 to begin repair operations of the first rail. At 11:47 a.m., the MofW foreman gave permission to CSX Locomotive # 420, CSX Train N337-09, to enter the south limits of his Form W Authority, with the understanding that they would not move beyond the north switch of Irby Yard at MP AK 553.9.

At approximately 2:15 p.m., the MofW foreman held a briefing with both crews prior to occupying the Main Track at MP AK554.6. After the briefing, the welding truck (OTE 75281) was placed on the Main Track facing northward and hi-railed to MP AK554.9, which is beyond the north end of the bridge. The section truck (OTE 74145) was placed on the Main Track facing the south and hi-railed in a backing direction toward the bridge, the section foreman overheard a train crew member announce over the radio that they were entering the Laurens Block in a southward direction.

The welding crew was standing behind their truck, and the section crew was standing behind their truck. The section crew was getting tools from their vehicle in preparation for rail repair. One section crew member remained in the truck.

The CSX timetable direction of travel was south. Geographic direction at the accident site was west. Timetable directions are used throughout this report.

THE ACCIDENT

CSX Train F224-17 was being operated at 26 miles per hour (mph) approaching the accident site; maximum authorized speed for light locomotives is 30 mph. The engineer said he was standing up to operate the radio, using channel # 58 as he attempted to call the dispatcher requesting authority to enter the Irby Block. He sounded the locomotive whistle for the Flemming Street crossing at MP AK555.25, and proceeded southward over the crossing into the Irby Block. The conductor and engineer stated that they did not see the Irby Block Sign as a result of operating the train locomotive with the long nose forward thereby lessoning the window of view as the train operated in the curve. As the train crossed Riverside Street, MP AK555.07, the engineer turned to sit down and observed two MofW vehicles on the track ahead of him. He then placed the locomotive into an emergency train air brake application. The train passed the red conditional stop sign placed on the west side of the track at MP AK555.07 and impacted the welding truck at MP AK554.9. As a result of the impact, the train pushed the welding truck 182 ft. which in turn impacted the section truck, pushing both vehicles an additional 32 ft. south before stopping on the bridge.

Moments before CSX Train F224-17 entered the Irby Block, the section foreman and machine operator heard the train whistle. The foreman said he had not been contacted by any train crew members requesting authority to enter his Form W. territory. He returned to the section truck and by use of the company radio on channel 32 attempted to contact the train opertating in the Laurens Block. At this same moment he observed CSX Train F224-17 in his rear view mirror. Simultaniously, the machine operator told the welders to clear the Main Track and retreat to a safe location. The foreman and trackman exited the truck and began running on the bridge walkway toward the south end of the bridge. The machine operator and second trackman ran off the north end

of the bridge to the west side. The welder and welder helper, who were already off the bridge, ran in a westerly direction. The track foreman and trackman were still on the bridge at the time of impact.

When the train came to a stop, the conductor exited the locomotive cab to check on the MofW people. The engineer made an emergency call on the radio to the dispatcher informing him of the collision and the location of the accident.

There were no injuries resulting from the collision. The locomotive and hi-rail vehicles remained upright and on the rail. The welding truck released an estimated 30 gallons of hydraulic fluid as a hydraulic hose was severed upon impact. The fluid dropped to a grass-covered area below the bridge. CSX notified Heapaco Environmental Services of the spill.

The bridge is a thru girder deck plate bridge, 385 feet in length, 35 feet high, with a walkway and hand rails on the west side, and spans Gordan Street and the Little River Creek. A public walking trail passes under the south end of the bridge.

Drug and alcohol testing of CSX Train F224-17 crew was conducted by CSX. The test results were negative.

ANALYSIS:

CSX Train F224-17 usually operates between the Spartanburg Yard and the Ora Block. The crew had operated in this location 7 or 8 trips; however pushing trains to Hunter Junction and continuing south to the Irby Block was beyond their normal job assignment. Operating the locomotive with the long nose forward was another unusual circumstance. The conductor and engineer expressed some frustration from the inability to contact the dispatcher throughout the day and both stated that this frustration added to distraction of operating the train.

The Federal Railroad Administration (FRA) determined that all permanent and temporary track side signs, as viewed from a locomotive cab, were unobstructed.

FRA obtained fatigue related information, including a 10-day work history, for all the employees involved in this incident. FRA concluded fatigue was not probable for any of these employees.

CSX Florence Division Timetable No. 4, effective January 1, 2005, designates Direct Traffic Control (DTC) as the type of authority for movement on the main track on the Spartanburg Subdivision. DTC divides the Main Track into sections called blocks. At 2:18 p.m., CSX Train F224-17 was issued DTC authority No. 54078 for southward movement in the Hunter and Laurens Blocks, but not the Irby Block.

On March 17, 2006, a CSX Rule 707 with working limits between MP AK547.6 and MP AK555.0 during the hours of 8:30 a.m. and 5:30 p.m., authority No. 16086 was issued to the CSX MofW foreman at 7:42 a.m. All temporary track signs that are required by CSX Rule 707 were in place.

CONCLUSION:

The CSX MofW employees were in full compliance with CSX Operating Rules and FRA Regulations for Roadway Workers.

PROBABLE CAUSE:

The cause of this accident, as determined by the FRA, was the failure of the crew of CSX Train F224-17 to stop at the Irby Block Sign. In addition, the train crew failed to stop at the Form W conditional stop sign placed at MP AK555.07 by the CSX MofW track foreman.