Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-66

CSX Transportation
Valdosta, GA
July 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-2006-66

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 000024078
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.: 000024078
4. U.S. DOT_AAR Grade Crossing Identification Number: 637479G	5. Date of Accident/Incident: Month 07 / Day 17 / Year 2006	6. Time of Accident/Incident: 04:34: ☐ 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): 07

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
4	0	0	0	Jacksonville

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Valdosta	AN649.7	N/A	GA	LOWNDES

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
94 F		2		2		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 3. East	Code
Main no. 1		2	15.7		2

OPERATING TRAIN #1

25. Type of Equipment Consist (single entry)	A. Spec. MoW Equip.	Code	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
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		1		1	Q68116

28. Speed (recorded speed, if available) R - Recorded E - Estimated: 21 MPH | Code: R

29. Trailing Tons (gross tonnage, excluding power units): 7146

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	N/A
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A

32. 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

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

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	3	0	0	0	0
(2) Total Derailed	0	0	0	0	0

35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	55	0	15	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
4866.55	5993	M307	N/A

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	N/A	2	N/A

Length of Time on Duty

44. Engineer/Operator	45. Conductor
Hrs 2 Mi 49	Hrs 2 Mi 49

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	50. Was EOT Device Properly Armed? 1. Yes 2. No
1	1

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

OPERATING TRAIN #2

52. Type of Equipment Consist (single entry)	A. Spec. MoW Equip.	Code	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
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		N/A		N/A	N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated: N/A MPH | Code: N/A

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): 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

58. 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

59. 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

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
(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

62. Cars	Loade a. Freight	Loade 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

63. Equipment Damage This Consist: N/A

64. Track, Signal, Way, & Structure Damage: N/A

65. Primary Cause Code: N/A

66. Contributing Cause Code: N/A

Number of Crew Members

67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

71. Engineer/Operator: Hrs N/A Mi N/A

72. Conductor: Hrs N/A Mi N/A

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

76. EOT Device? 1. Yes 2. No: N/A

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

78. Caboose Occupied by Crew? 1. Yes 2. No: N/A

Highway User Involved

79. Type — Code: C
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)

80. Vehicle Speed (est. MPH at impact): 10

81. Direction geographical) — Code: 1
1.North 2.South 3.East 4.West

82. Position — Code: 3
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: 2
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

83. Equipment — Code: 1
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)

84. Position of Car Unit in Train: 1

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

86b. Was there a hazardous materials release by — Code: 4
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)							
	01	02	03	06	N/A	N/A	N/A

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

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

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

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

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

93. Driver's Age: 57

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

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

96. Driver — Code: 3
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: 2
1. Yes 2. No 3. Unknown

98. View of Track Obscured by (primary obstruction) — Code: 8
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
	0	2

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

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

102. Highway Vehicle Property Damage (est. dollar damage): 25000

103. Total Number of Highway-Rail Crossing Users (include driver): 2

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

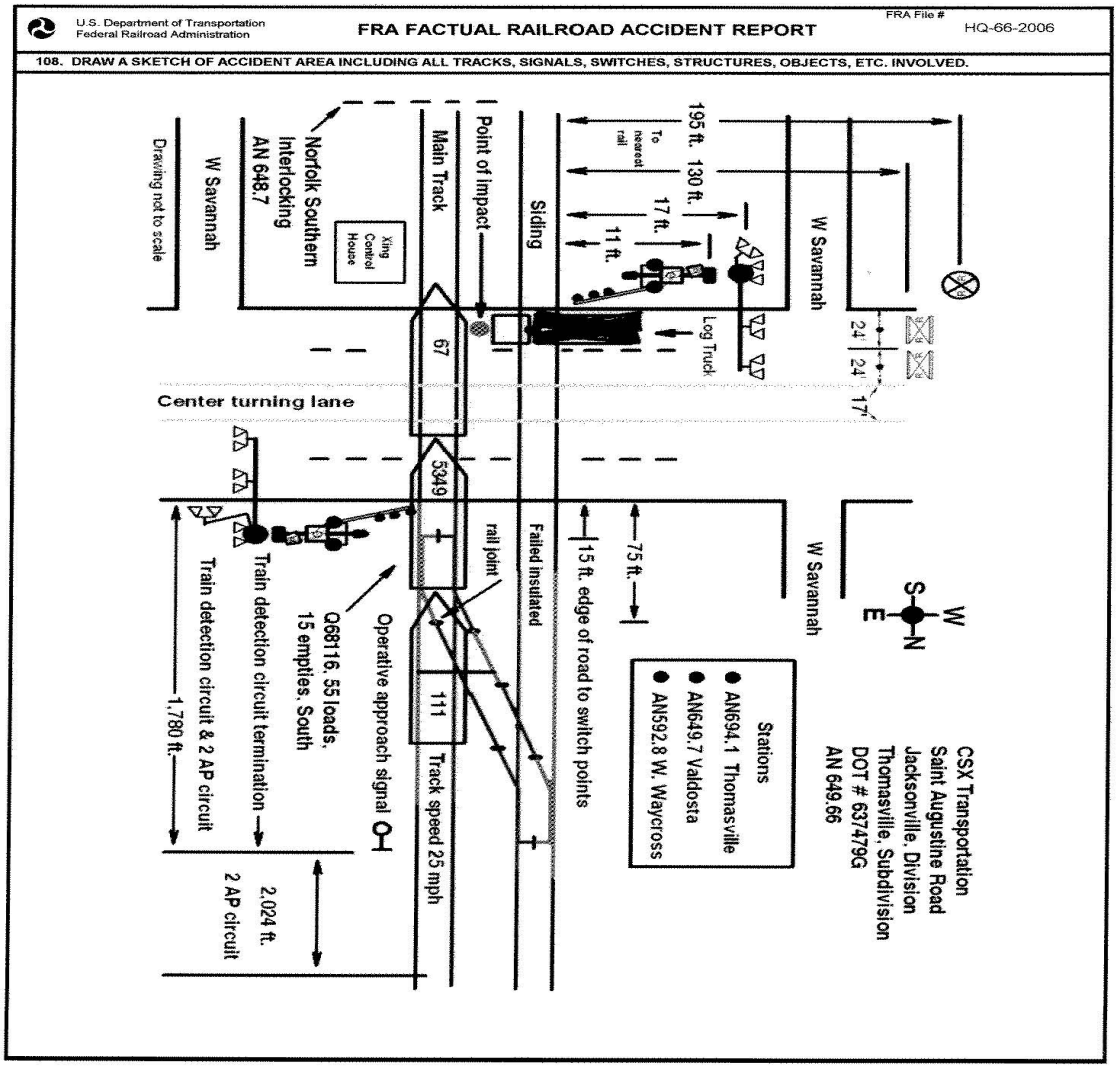
105. Locomotive Auxiliary Lights Operational? — Code: 1
1. Yes 2. No

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

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

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

HQ-2006-
66
sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

A southbound CSX freight Train Q68116 collided with a log truck at Saint Augustine Road highway-rail grade crossing on July 17, 2006, at 4:34 p.m. Eastern Standard Time (EST). The accident occurred in Valdosta, Georgia (GA), at CSX milepost AN649.66, on the Jacksonville Division, Thomasville Subdivision.

The log truck driver and passenger were treated for injuries and released. The log truck was completely destroyed. There were no injuries to the train crew and no derailment. Total damages reported are $4,866.55 for equipment and $5,933 for signal/track.

At the time of the accident, it was daylight, overcast, and a temperature of 94 ºF.

The accident was caused by the highway-rail grade crossing warning system's failure to detect the approaching train. An insulated rail joint in the train detection circuit caused the activation failure.

110. NARRATIVE

Circumstances Prior to the Accident

On July 16, 2006, freight Train Q68116 originated at CSX Boyles Terminal in Birmingham, Alabama (AL). An initial terminal air brake test was performed at this facility. The train's final destination was Rice Yard, Waycross, GA. At Dothan, AL cars were set out and picked up and a class 3 air brake test was performed and they proceeded to CSX Thomasville Yard, Thomasville, GA.

On July 17, the Train Q68116 crew included a locomotive engineer, trainee locomotive engineer,
and a conductor. They went on duty at 1:45 p.m., at CSX Thomasville Yard. Their home terminal is Waycross and all crew members received more than eight hours off duty time. Their assigned freight train consisted of three locomotives, 55 loads, 15 empties, with two empty and two loaded hazardous material cars in the consist. It was 4,551 feet long and weighed 7,146 tons. At 2:02 p.m. they obtained a Thomasville block authority to proceed southward on the Thomasville Subdivision.

As Train Q68116 approached the accident area, the trainee engineer was seated at the controls on the west side of the leading locomotive. The conductor was seated on the east side and the engineer was seated in the center of the cab of the leading locomotive. The train was operating at 22 miles per hour (mph) on the main track (MP AN649.66).

From MP AN650 to the point of the accident the track is tangent. There is a 0.18-percent descending grade for about 750 feet, then a 0.12-percent ascending grade to the accident site, Saint Augustine Road, which is straight and on grade.

Saint Augustine Road is an asphalt surface with two lanes for eastbound highway traffic and two lanes for westbound highway traffic. Eastbound the highway lanes are 24 feet wide and there is a center turning lane that is 17 feet wide. From west to east there are two tangent tracks that intersect Saint Augustine Road highway-rail grade crossing. They are designated as siding and main track. The railroad crossing surface is concrete.

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

The Accident

Train Q68116 South

The trainee engineer said as they approached the operative approach signal (MP AN650) to the Norfolk Southern interlocking (MP AN648.7) the signal displayed an approach. He then switched to dynamic braking prepared to stop at the absolute signal. As they approached Saint Augustine Road, he noticed that the grade crossing warning devices did not activate at the usual point. He sounded the horn continuously to warn highway traffic. As they approached the crossing, the crossing gate arms did not come down and he observed a log truck enter the crossing that was not going to stop. The log truck struck the lead locomotive at the front steps and beneath the engineer's window. The trainee engineer immediately initiated an emergency application of the brakes. The speed was recorded by the event recorder of the controlling locomotive. The maximum authorized speed for the main track is 25 mph and the speed at impact was 21 mph. The trainee engineer's view of the grade crossing was unobstructed.

Highway Vehicle

The vehicle involved was a 1984 Kenworth tractor and trailer loaded with logs. The cab was occupied by a 57-year-old male driver and an 11-year-old male

passenger. The direction of the log truck was east on Saint Augustine Road. The highway-rail grade crossing warning devices did not activate for the approaching train. When the log truck driver observed the oncoming train, he applied the vehicle's brakes. According to the Motor Vehicle Accident Report, the log truck skidded 128 feet and struck the lead locomotive. The driver's view of the oncoming train was unobstructed.

The log truck struck the lead locomotive on the engineer's side at the front stairs and beneath the engineer's window. The driver and passenger remained in the cab. At impact the log truck was forced south and parallel with the tracks and train. The trailer struck the signal mast located on the south west quadrant. The train came to a stop about 400 feet south of Saint Augustine Road.

After the train stopped, the trainee engineer stayed on the locomotive to establish radio communication with the AC Dispatcher. The conductor walked back to the accident scene to await arrival of emergency response personnel.

A Valdosta police officer arrived at the scene at 4:35 p.m. Emergency Medical Services (EMS) were notified at 4:35 p.m. and arrived at the scene at 4:43 p.m. The log truck driver and passenger were taken to South Georgia Medical Center by EMS and arrived at 4:57 p.m. The train was released at 6:47 p.m. and continued the trip to Waycross.

Analysis and Conclusions

Analysis

No toxicological tests were performed on the train crew or log truck driver.

Saint Augustine Road is equipped with gate arms, cantilevered flashing lights, flashing lights, and bells. The warning devices are controlled by a Harmon Crossing Processor (HXP). There are railroad cross buck signs mounted on the cantilever masts and arms. There is a passive railroad crossing sign placed 195 feet west of the nearest rail. There are railroad crossing pavement markings placed 130 feet west of the nearest rail. The posted highway speed is 45 mph. The method of operation on the Thomasville Subdivision is by Direct Traffic Control.

A whistle post was not found in the southbound approach to the highway-rail grade crossing. The locomotive recorder data indicated the trainee engineer began sounding the horn 619 feet north of the crossing. All three train crewmen said the gate arms and lights at Saint Augustine Road were not working properly. After this observation they said the trainee engineer sounded the horn continuously to warn highway users. The engineer said he observed a couple of westbound vehicles stop. He made this observation from the conductor's window. The trainee engineer said he observed a vehicle enter the crossing that was not going to stop. He made this observation from the engineer's window.

On July 17, immediately after the accident, CSX signal personnel investigated the activation failure. North of the grade crossing there is a hand-operated crossover from the main track to the siding. On the main track the switch points are located 15 ft. from the edge of the road. There is an insulated rail joint located on the reverse closure rail between the point and frog. The insulated rail joint is 75 ft. from the edge of the road. Inspection of this insulated rail joint revealed that the end rails were together at one time. Testing and investigation determined that this insulated rail joint caused the activation failure.

On July 18, CSX signal personnel inspected Saint Augustine Road highway-rail grade crossing warning devices in the presence of a Federal Railroad Administration (FRA) signal and train control inspector. At the time of the inspection the original insulated rail joint was still in place. A simulated test was conducted by CSX and FRA. A zero resistance shunt was placed around the insulated rail joint on the reverse closure rail. Then shunt tests were made on the southbound approach to the grade crossing, utilizing a zero resistance shunt. Testing determined that the train detection device did not detect a shunt until it was placed 65 ft. from the edge of the road. Testing determined that a defective insulated rail joint, on the reverse closure rail, will cause a short approach to the grade crossing. All test shunts were removed and a test train was operated over the grade crossing at maximum authorized track speed, in both directions, and the warning devices functioned as intended.

On July 18, the defective insulated rail joint was replaced with another Portec Poly-Insulated Rail Joint. The highway-rail grade crossing warning devices were returned to service. On July 19, an observation of the insulated rail joint determined that the stock rail was cutting into the insulated bars. On July 20, CSX replaced the stock rail and insulated rail joint with another Portec Poly-Insulated Rail Joint.

CSX contracted an HXP expert. He arrived at the crossing on July 20, at about 5 p.m. Upon arrival he performed an installation checkout procedure on the HXP. He conducted a simulated test, the same as on July 18, with the same results. A test train was operated over the grade crossing, in both directions, and the warning devices functioned as intended. He did not recommend any adjustments to the HXP or indicate any problems with the train detection device.

On July 21, CSX signal personnel removed the HXP train detection device and installed a Harmon Industries Phase Motion Detector (PMD-3). The HXP train detection device is not designed with a false shunt feature. The PMD-3 is designed with a false shunt feature.

Saint Augustine Road is in the approach to an automatic interlocking. This interlocking is maintained by Norfolk Southern (NS) signal employees and is equipped with a data recorder. Review of the data indicated that the southbound approach to the interlocking was occupied at 4:31:53. This approach circuit is 3,804 feet in length. The locomotive recorder indicates that the accident occurred at 4:34:55. There is time difference of 182 seconds from the accident and the time the approach indicated occupied. The train was traveling at 22 mph. At this speed it would take the train 118 seconds to traverse this length of track. The NS recorder time was verified by a CSX signal supervisor.

Review of CSX's highway-rail grade crossing tests and inspection records revealed an annual grade crossing test was completed on 01/05/06, quarterly tests were completed 1/05/06, 4/02/06, and 6/16/06. The last record of the insulated rail joint inspection was 6/16/06. The frequency of the monthly tests and inspections complied with FRA regulations. Review of the railroads malfunction records revealed there were ten reported trouble logs within the last 365 days.

The locomotive was equipped with a headlight, the auxiliary lights, and the audible warning device required by Federal regulations. These devices were tested at the accident site by a CSX road foreman of engines. The locomotive was equipped with a speed indicator and an event recorder as required. The relevant event recorder was downloaded by CSX mechanical at Rice Yard, Waycross, GA. The analysis disclosed that the locomotive engineer was in compliance with all applicable railroad operating and train handling requirements.

Conclusions

Testing determined that an insulated rail joint in the train detection circuit caused the activation failure. This insulated rail joint is located on the reverse closure rail between the point and frog, 75 ft. from the edge of the road. Testing determined that if this insulated rail joint fails, the train detection device HXP will not detect an incoming train beyond 65 feet.

Probable Cause

The Federal Railroad Administrations investigation found the probable cause to be the activation failure of the highway-rail grade crossing warning devices.