



***Federal Railroad Administration  
Office of Safety  
Headquarters Assigned  
Accident Investigation Report  
HQ-2011-30***

***CSX Transportation (CSX)  
Morristown, IN  
July 6, 2011***

***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.***

1. Name of Railroad Operating Train #1 CSX Transportation [CSX]		1a. Alphabetic Code CSX		1b. Railroad Accident/Incident No. R000091427	
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. R000091427	
5. U.S. DOT_AAR Grade Crossing Identification Number		6. Date of Accident/Incident Month 07 Day 06 Year 2011		7. Time of Accident/Incident 05:41:00 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
8. Type of Accident/Incident (single entry in code box)					
1. Derailment		4. Side collision		7. Hwy-rail crossing	
2. Head on collision		5. Raking collision		10. Explosion-detonation	
3. Rear end collision		6. Broken Train collision		11. Fire/violent rupture	
		9. Obstruction		12. Other impacts	
				13. Other (describe in narrative) Code 01	
9. Cars Carrying HAZMAT 19		10. HAZMAT Cars Damaged/Derailed 5		11. Cars Releasing HAZMAT N/A	
				12. People Evacuated 0	
				13. Division Indianapolis	
14. Nearest City/Town Morristown		15. Milepost (to nearest tenth) 99.8		16. State Abbr Code IN 18	
				17. County SCOTT	
18. Temperature (F) (specify if minus) 92 F		19. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 2		20. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 1	
				21. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1	
22. Track Name/Number Single Main Track		23. FRA Track Code Class (1-9, X) 3		24. Annual Track Density (gross tons in millions) 5	
				25. Time Table Direction Code 1. North 3. East 2. South 4. West 4	
OPERATING TRAIN #1					
26. Type of Equipment Consist (single entry)		1. Freight train		4. Work train	
2. Passenger train		5. Single car		7. Yard/switching	
3. Commuter train		6. Cut of cars		A. Spec. MoW Equip. Code	
		9. Maint./inspect.car		27. Was Equipment Attended? Code 1. Yes 2. No 1	
29. Speed (recorded speed, if available) Code R - Recorded E - Estimated 28 MPH R		31. Method(s) of Operation (enter code(s) that apply) a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track c. Auto train stop i. Time table/train orders o. Positive train control d. Cab j. Track warrant control p. Other (Specify in narrative) Code(s) e. Traffic k. Direct traffic control f. Interlocking l. Yard limits		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	
30. Trailing Tons (gross tonnage, excluding power units) 5700					
32. Principal Car/Unit		a. Initial and Number CSXT 5255		b. Position in Train 1	
(1) First involved (derailed, struck, etc)				c. Loaded (yes/no) no	
(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		c. Remote	
		d. Manual		c. Remote	
(1) Total in Train		2		0 0 0 0	
(2) Total Derailed		2		0 0 0 0	
				36. Cars a. Freight b. Pass. c. Freight d. Pass. e. Caboose (1) Total in Equipment Consist 39 0 54 0 0 (2) Total Derailed 10 0 6 0 0	
37. Equipment Damage This Consist \$662,897.00		38. Track, Signal, Way, & Structure Damage \$54,600.00		39. Primary Cause Code T111	
				40. Contributing Cause Code N/A	
				41. Engineer/Operators 1	
		42. Firemen 0		43. Conductors 1	
		44. Brakemen 0		45. Engineer/Operator Hrs 9 Mi 41	
				46. Conductor Hrs 9 Mi 41	
Casualties to:		47. Railroad Employees		48. Train Passengers	
Fatal		0		0	
Nonfatal		0		0	
				49. Other 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 2	
OPERATING TRAIN #2					
53. Type of Equipment Consist (single entry)		1. Freight train		4. Work train	
2. Passenger train		5. Single car		7. Yard/switching	
3. Commuter train		6. Cut of cars		A. Spec. MoW Equip. Code	
		9. Maint./inspect.car		54. Was Equipment Attended? Code 1. Yes 2. No 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 g. Automatic block m. Special instructions b. Auto train control h. Current of traffic 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)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
				N/A N/A N/A N/A N/A	N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol N/A	Drugs N/A
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A			
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A	61. Was this consist transporting passengers? (Y/N)		N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual c. Remote	Rear End d. Manual c. Remote	63. Cars	Loaded a. Freight b. Pass.	Empty c. Freight 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				Length of Time on Duty			

68. Engineer/Operators	69. Firemen	70. Conductors	71. Brakemen	72. Engineer/Operator	73. Conductor
N/A	N/A	N/A	N/A	Hrs N/A Mi N/A	Hrs N/A Mi N/A
Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other	77. EOT Device?	78. Was EOT Device Properly Armed?
Fatal	N/A	N/A	N/A	1. Yes 2. No N/A	1. Yes 2. No N/A
Nonfatal	N/A	N/A	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	81. Was Equipment Attended?	Code	82. Train Number/Symbol
				N/A	1. Yes 2. No	N/A	N/A

83. Speed (recorded speed, if available)	Code	85. Method(s) of Operation (enter code(s) that apply)	85a. Remotely Controlled Locomotive?
R - Recorded E - Estimated	N/A MPH N/A	a. ATCS b. Auto train control c. Auto train stop d. Cab e. Traffic f. Interlocking	0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
84. Trailing Tons (gross tonnage, excluding power units)	N/A	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	N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol N/A	Drugs N/A
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A			
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A	88. Was this consist transporting passengers? (Y/N)		N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual c. Remote	Rear End d. Manual c. Remote	90. Cars	Loaded a. Freight b. Pass.	Empty c. Freight 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

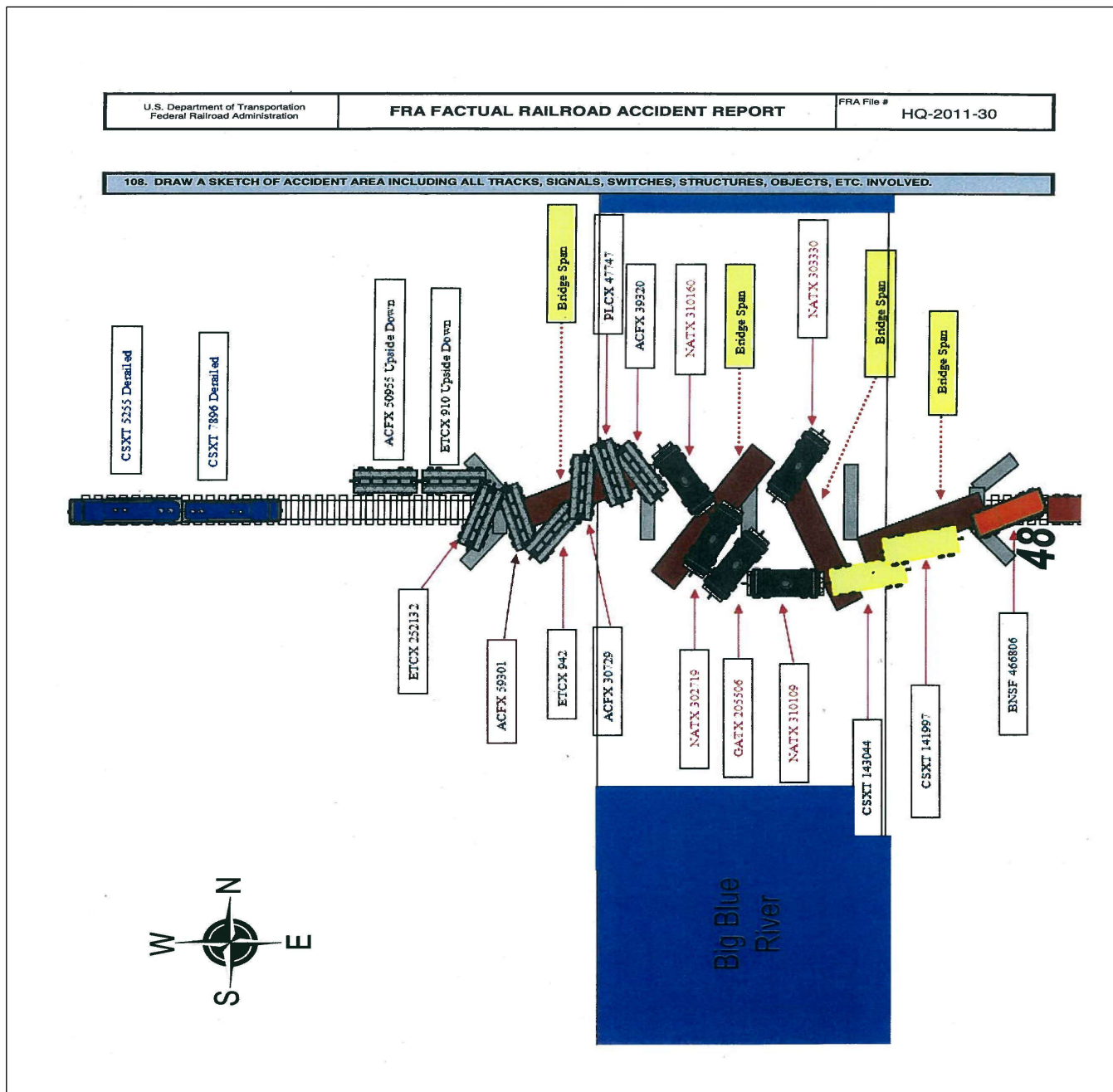
91. Equipment Damage This Consist	N/A	92. Track, Signal, Way, & Structure Damage	N/A	93. Primary Cause Code	N/A	94. Contributing Cause Code	N/A
Number of Crew Members				Length of Time on Duty			

95. Engineer/Operators	96. Firemen	97. Conductors	98. Brakemen	99. Engineer/Operator	100. Conductor
N/A	N/A	N/A	N/A	Hrs N/A Mi N/A	Hrs N/A Mi N/A
Casualties to:	101. Railroad Employees	102. Train	103. Other	104. EOT	105. Was EOT Device Properly
Fatal	N/A	N/A	N/A	1. Yes 2. No N/A	1. Yes 2. No N/A
Nonfatal	N/A	N/A	N/A	106. Caboose Occupied by Crew?	
				1. Yes 2. No	N/A

Highway User Involved				Rail Equipment Involved			
107. C. Truck-Trailer A. Auto B. Truck 108. Vehicle Speed (est. MPH at impact)	F. Bus G. School Bus H. Motorcycle	J. Other Motor Vehicle K. Pedestrian M. Other (spec. in narrative)	Code N/A	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
109. geographical 1. North 2. South 3. East 4. West			Code N/A	112. Position of Car Unit in	N/A		

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 1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wigs 5. Hwy. traffic signals 6. Audible Warning 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other (spec. in narr.) 12. None				Code N/A	116. Signaled Crossing (See instructions for codes)				Code N/A	117. Whistle Ban 1. Yes 2. No 3. Unknown	
Code(s)				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	
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	
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	
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)	
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

On July 6, 2011, at 5:41 p.m., e.d.t., a CSX Transportation (CSX) freight train, S36106 (S361) operating westbound on CSX's Indianapolis Subdivision, derailed two locomotives and 16 freight cars at milepost BD99.8. The accident occurred approximately one mile west of Morristown, Indiana, on the Single Main Track. The derailment destroyed approximately 780 feet of main track, a deck plate girder bridge, and two approach spans over the Big Blue River.

There were five cars carrying hazardous materials involved in the derailment with no release of product and no injuries reported. No emergency personnel responded to the accident and there was no evacuation. There was \$662,897 estimated equipment damage and \$54,600 estimated track and structures damage. The weather was sunny and the temperature was 92 °F.

The probable cause of the derailment was insufficient fasteners due to decayed bridge timbers.

## 138. NARRATIVE

## CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of S361 included a locomotive engineer and a conductor. They went on duty at 8 a.m., on July 6, 2011, at Queensgate Yard in Cincinnati, Ohio, their home terminal. Both crew members received more than the statutory off duty period prior to reporting for duty. The conductor had 57 hours 40 minutes and the engineer had 81 hours 43 minutes off duty. The crew was issued their paperwork in Queensgate Yard, Cincinnati and held a job briefing before departing the yard office to assemble their train. They picked up two locomotives from the locomotive facility and attached them to their train in the departure yard. The mechanical department conducted a Class I air brake test prior to departure.

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

S361 consisted of two locomotives and 93 cars of mixed freight. The train had 39 loaded and 54 empty cars, was 5,647 feet in length, and weighed 6,505 tons. The train departed the yard at approximately 11 a.m. and encountered typical delays due to traffic between Cincinnati and Hamilton, Ohio, on the CSX Cincinnati Terminal Subdivision. The crew received and copied EC-1 authority to occupy the Indianapolis Subdivision at Hamilton, Ohio. They met one eastbound train en route and followed train J78406 for a portion of the trip between Hamilton and Morristown, Indiana. As S361 approached the accident area, the locomotive engineer was seated at the controls on the north side of the leading locomotive. The conductor was seated on the south side of the same locomotive.

As the train approached Morristown from the east there was no significant grade within the three miles prior to the derailment area with one exception, a 0.8 percent descending grade in the direction of travel for approximately one and one-half miles, ending approximately one-half mile before the point of derailment (POD). The grade was flat beyond the POD for four-tenths mile followed by a 0.7 percent ascending grade for one-half mile. There is one curve within the 10 miles leading up to the derailment area, a 0-degree, 15-minute left hand curve approximately 500 feet in length located approximately one mile east of the derailment

site. The track is tangent for more than eight miles beyond the POD.

S361 was being operated at speeds between 26 and 30 mph with the train in dynamic braking for two minutes prior to the derailment. At the time the accident occurred, the train was being operated at a recorded speed of 28 mph. The speeds were recorded by the event recorder of the controlling locomotive, CSXT 5255. The maximum authorized speed for freight trains on this section of the Indianapolis Subdivision is 40 mph, as designated in the current CSX Louisville Division Timetable No. 7, dated January 1, 2011. The speed of S361 was restricted by a "Heat Order", Dispatcher Message No. 32953, which reduced the maximum authorized speed of this freight train by 10 mph between 1300 and 1900 hours.

### THE ACCIDENT

As S361 approached the Big Blue River Bridge at CSX Milepost BD 99.8, the engineer noticed the south rail on the bridge was out of alignment toward the outside of the bridge. He instructed the conductor to secure himself because he was confident the train was going to derail. The train proceeded onto the bridge and the locomotives derailed approximately 22 feet from the east abutment. The locomotives proceeded across the bridge an additional 265 feet. When they reached the west end of the bridge, the engineer initiated an emergency application of the air brakes from the rear of the train by utilizing the end-of-train device toggle switch. After the train stopped, the crew called the dispatcher on the radio and notified him of the derailment. The conductor dismounted the locomotive to make a walking inspection of the train and assess the damage. He observed both locomotives and three cars had crossed the bridge and were derailed. When he reached the bridge he discovered that the bridge had collapsed and several derailed cars were in the river.

The derailed equipment consisted of two locomotives and the head 16 cars of the train, eight of which came to rest in the river. Of the 16 derailed cars, five contained denatured ethanol residue. All five placarded cars were in the river.

The damaged bridge was a four span deck plate girder with an open timber deck. The bridge was 286 feet in length. All four spans of the bridge were severely damaged. CSX identified the POD to be 22 feet west of the east back wall of the bridge.

### ANALYSIS AND CONCLUSIONS

#### Post Accident Toxicological Testing

Analysis: There was no post-accident toxicological testing performed on the train crew, nor was testing required. A determination was made by responding railroad managers that, based on how the train was handled approaching and passing over the bridge to a stop, Federal Testing would not be necessary.

Conclusion: FRA takes no exception to this decision.

#### Fatigue

Analysis: FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is considered to be comparable to blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to the information obtained from each employee. If any employee does not provide sleep information, FRA uses the default software settings.

FRA used a fatigue analysis software program to create an analysis model of the overall effectiveness rate of each crew member at the time of the accident. This model was produced through calculations made using collected work/rest data from the recent past of the crew members. FRA obtained fatigue related information, including a 10-day work history, for the two employees involved in the accident.

Conclusion: Fatigue was not probable for either employee.

#### Event recorder

Analysis: FRA analyzed the event recorder data provided by the CSX for Lead Locomotive CSX 5255. The event recorder data prior to the derailment suggested that train handling was consistent with what would be expected for the movements made. The data also suggested that the emergency application of the air brakes was induced by an undesired emergency application of the train air brakes.

Conclusion: Train speed and handling were not causal factors in this derailment.

#### Bridge Structure

Analysis: The post accident inspection of the bridge at milepost BD 99.8 determined that the damage and failure of the bridge was a result of being struck by the derailed cars. The bridge timbers at the POD were found to be decayed and unable to hold fasteners.

Conclusion: The physical condition of the open bridge deck timbers was a causal factor in this accident.

#### Equipment

Analysis: The rail cars involved in the derailment were damaged so extensively that only the rear car was salvaged. Due to the severity of the derailment, mechanical inspection of the derailed equipment was very minimal. There were no FRA exceptions taken during the on-site mechanical inspection of the train.

Conclusion: The mechanical conditions of the equipment could not be eliminated as a causal factor.

#### Track Structure

Analysis: The last track inspection prior to the accident was performed by a qualified CSX track inspector on July 6, 2011, and no defects were noted within the area of the derailment. The latest geometry survey of the Indianapolis Subdivision was conducted on April 12, 2011, with no defects noted in the area of the derailment.

Inspection of the track in the area after the derailment by FRA revealed sufficient rail anchors to restrain rail movement on the undisturbed track east of the derailment area. Tie condition in the area ranged from fair to good condition, compliant with the FRA Track Safety Standards for Class 3 track. Track surface in the subject area was also in compliance with FRA Class 3 Standards. Post inspection of the bridge timber at the POD was found to be in poor condition with internal decay.

The rail throughout the derailment area was primarily 115 pound second hand continuous welded rail (CWR) laid in the 1970's. The majority of this rail was milled in the early 1950's. The last ultrasonic rail test in this area was conducted by CSX on June 29, 2011 and no defects were noted in the subject area.

Conclusion: The condition of the bridge timbers and fasteners were the primary causal factors in the accident.

#### PROBABLE CAUSE AND CONTRIBUTING FACTORS

The probable cause of the derailment was insufficient fasteners due to decayed bridge timbers.