Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-06

Amtrak (ATK)
Garrison, Kentucky
January 26, 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-2006-6

1.Name of Railroad Operating Train #1: Amtrak [ATK]	1a. Alphabetic Code: ATK	1b. Railroad Accident/Incident No.: 099668
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: Amtrak [ATK]	3a. Alphabetic Code: ATK	3b. Railroad Accident/Incident No.: 099668
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 01 / Day 26 / Year 2006	6. Time of Accident/Incident: 01:08: ☑ 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): 01

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

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Garrison	563.7	N/A	KY	LEWIS

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
34 F		4		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 3. East	Code
single main		4	30		4

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
	2	1	1	P05125

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

29. Trailing Tons (gross tonnage, excluding power units): 180

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)				
e	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	2	yes
(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): Y

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	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	5	0	1	0
(2) Total Derailed	0	2	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
600	500	T204	T199

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	1	1	1

Length of Time on Duty

44. Engineer/Operator	45. Conductor
Hrs 2 Mi 18	Hrs 2 Mi 18

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
2	2

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

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

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)	N/A	N/A	N/A		N/A	N/A
(2) Causing (if mechanical cause reported)	N/A	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	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
N/A	N/A	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
N/A	N/A	N/A	N/A	Hrs N/A Mi N/A	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?	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
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): 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) 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: 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	88. Signaled Crossing Warning (See instructions for codes) Code	89. Whistle Ban Code
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	N/A	1. Yes 2. No 3. Unknown N/A
Code(s): N/A N/A N/A N/A N/A N/A N/A		

90. Location of Warning Code	91. Crossing Warning Interconnected with Highway Signals Code	92. Crossing Illuminated by Street Lights or Special Lights Code
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach: N/A	1. Yes 2. No 3. Unknown: N/A	1. Yes 2. No 3. Unknown: N/A

93. Driver's Age	94. Driver's Gender Code	95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code	96. Driver Code
N/A	1. Male 2. Female: N/A	1. Yes 2. No 3. Unknown: 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): N/A

97. Driver Passed Standing Highway Vehicle Code	98. View of Track Obscured by (primary obstruction) Code
1. Yes 2. No 3. Unknown: 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: N/A

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

99. Driver Was Code	100. Was Driver in the Vehicle? Code
1. Killed 2.Injured 3. Uninjured: N/A	1. Yes 2. No: N/A

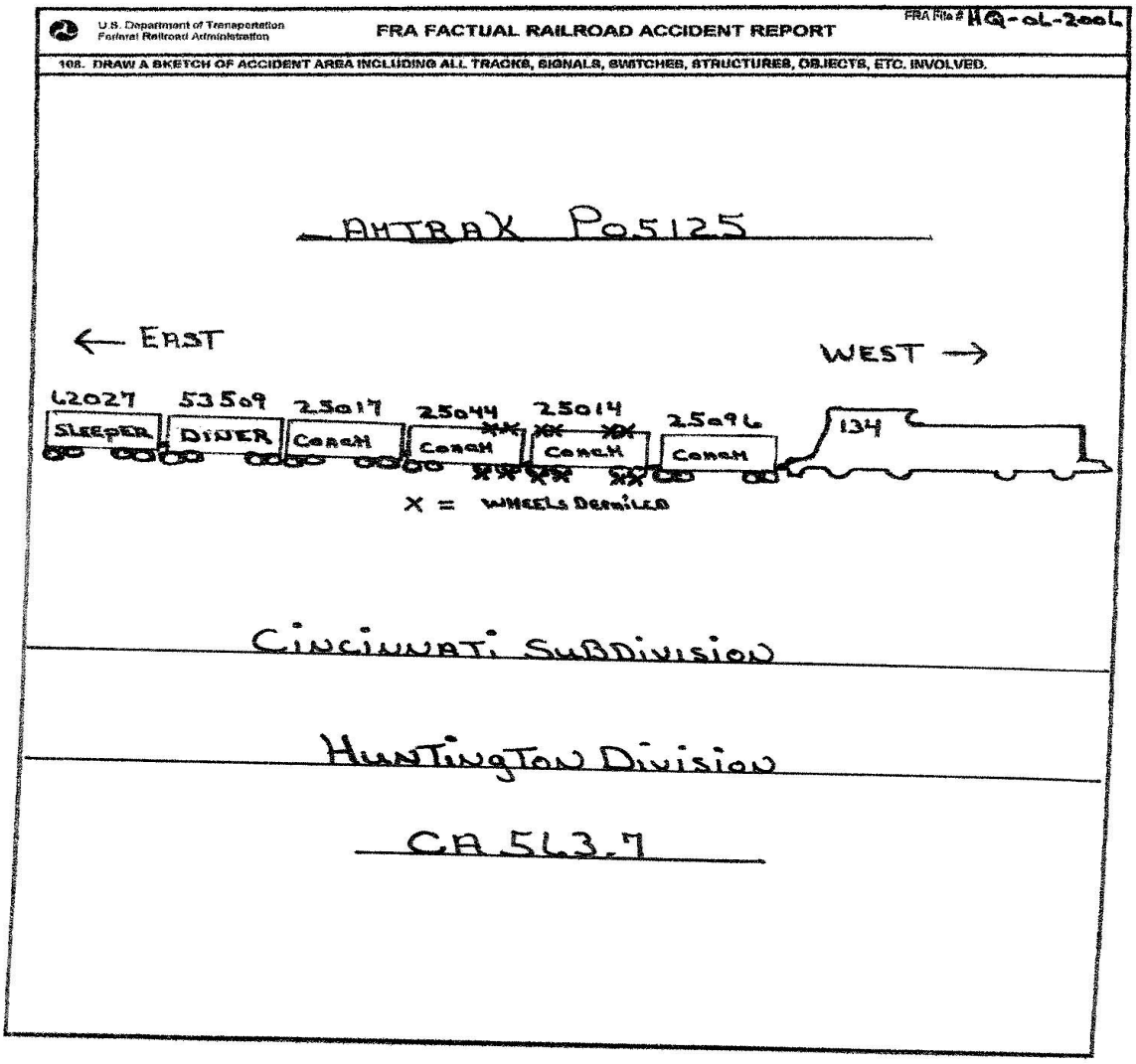
102. Highway Vehicle Property Damage (est. dollar damage)	103. Total Number of Highway-Rail Crossing Users (include driver)
N/A	N/A

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

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

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

HQ-06-
2006
sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

A derailment occurred on January 26, 2006, involving Amtrak (ATK) Passenger Train No. P05125 at 1:08 a.m., Eastern Standard Time (EST). The train was traveling westbound from Huntington, West Virginia (WV) toward Cincinnati, Ohio (OH) when the derailment occurred on CSX Transportation, Inc. (CSX) trackage at milepost (MP) CA 563.7 near Garrison, Kentucky (KY) in Lewis County on the CSX Cincinnati Subdivision, Huntington Division.

Only two passenger cars of the train were derailed as a result of the incident. The second railcar behind the locomotive had all wheels derailed and the third railcar behind the locomotive had all wheels on the lead or west end of the railcar derailed. There was no damage to any other equipment. There were no injuries to passengers or crew members. There was no hazardous materials involved and no evacuation performed. Total damage reported as a result of the derailment was $600 to the equipment and $500 to the track. No other damages are evident. All crew members received proper rest under the hours of service law.

At the time of the derailment, it was dark and clear with a recorded temperature of 34 °F.

The cause of the accident is a broken rail (field weld).

110. NARRATIVE

Circumstances Prior to the Accident

On January 25, 2006, the crew members of ATK Passenger Train P05125 reported for duty at Huntington, WV. The train crew consisted of an engineer instructor pilot, a certified engineer trainee, second engineer/fireman, conductor, and a trainman. The crew was assigned to operate the train westbound timetable direction from Huntington to Cincinnati, OH, a distance of about 150 miles. Indianapolis, Indiana (IN) is the home terminal for this crew. The crew reported for duty at Huntington at 10:50 p.m. EST after a rest period of 14 hours for all members of the train crew.

Train P05125 consisted of six rail cars: four passenger, one diner, and one sleeper. The first passenger car located behind the locomotive was unoccupied with the remainder of the equipment occupied by 71 passengers. The conductor and the trainman were performing duties in the equipment occupied by the passengers. The other three crew members were occupying the operating compartment of the locomotive. The engineer trainee, who was qualifying in operating over that territory, was at the controls of the locomotive under the direct supervision of the engineer instructor pilot.

The crew members received the necessary dispatcher's bulletin for their train, train brake test documentation, and was cleared to proceed by the CSX Transportation, Inc. (CSX) CR train dispatcher. CSX is responsible for track maintenance for this territory. The train crew departed Huntington at 11:30 p.m. bound for an intermediate stop in Cincinnati.

The train crew received clear signal indications from the time they departed Huntington until they encountered an advanced approach signal indication at MP CA 558.0; a restricted signal at Quincy, MP CA 561.0; then a stop signal at east Garrison, MP CA 563.7. The CSX CR train dispatcher noticed that a track signal indication light had remained illuminated subsequent to the passage of Train K587, a steel freight train operating in the westbound direction preceeding Amtrak Passenger Train P05125. The CSX CR train dispatcher notified the train crew that a track light was on after Train K587 cleared the block at Garrison, MP CA 563.7. The dispatcher issued verbal authority to pass the positive stop signal at Garrison to the operating crew in accordance with the operating rules. The method of operation on the entire Cincinnati Subdivision is Traffic Control.

Approaching the derailment location the track is tangent and is single main track. It is comprised of 122 lb continuous welded rail (CWR). The track is level with a 0-percent grade. The CSX Huntington Division East Timetable No. 1 effective Saturday, January 1, 2005, authorizes a maximum speed of 79 miles per hour (mph) for passenger trains and 55 mph for freight trains.

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

The train crew approached the signals at MPs CA 558.0, CA561.0, and CA 563.7 in accordance with the provisions of the operating rules and instructions from the CSX CR train dispatcher. The crew members proceeded past the signal at the east end of Garrison after bringing the train to a complete stop prior to passing the stop signal, in accordance with the rules. The speed of the movement, as indicated by the event recorder immediately prior to the derailment, was three mph.

The Accident

After receiving permission from the dispatcher to pass the stop signal at east Garrison, the train crew proceeded past the stop signal at a speed of three mph, which allowed them to observe the track conditions ahead. The engineer trainee said he noticed the track appeared soggy and muddy. There was a distance of about 33 feet before the train would encounter a switch and this was where the concentration of the operating crew was focused. Suddenly, as they proceeded toward the

switch, the crew experienced an unexpected jerk or pull accompanied by a vibration and stopped the movement of the train. The engineer trainee applied a normal brake application instead of putting the train into emergency. The engineer instructor pilot and the engineer/fireman dismounted the locomotive to perform an inspection of the train. Their inspection revealed that the second and third passenger cars were derailed with the fourth through the sixth cars remaining on the rail. As they continued their inspection, they observed a section of rail was missing from the track underneath the train. The engineer instructor pilot notified the CSX CR train dispatcher at 1:08 a.m. of the derailment involving a broken rail and two derailed passenger cars.

The initial point of derailment (POD) was determined to be at MP CA 563.7. The first piece of equipment to derail was determined to be ATK passenger car No. 25014.

The CSX track inspector was the first responder to arrive at the derailment location. Upon his arrival at 1:13 a.m., the track inspector began assessing the track damage caused by the derailment and contacted his immediate supervisor, informing him of the damages. Other CSX personnel such as the CSX roadmaster, CSX road foreman of engines, CSX trainmaster, and the CSX assistant division manager arrived at the accident scene between 2:10 a.m. and 2:30 a.m.

There were no reported injuries to the passengers or the train crew at the time of the derailment. Upon immediate notification, CSX and ATK officials made preparations to transport the ATK passengers from the derailment location to their destinations in Cincinnati, Indianapolis, and Chicago. The passengers were escorted from the ATK train and transported by way of two chartered busses owned by Croswell bus lines, headquartered in Cincinnati. The chartered buses arrived at the location at 7:05 a.m. and departed at 7:25 a.m.

Analysis and Conclusion

On January 26, 2006, FRA conducted a track inspection of the derailment area. The broken rail, identified as a field weld, occurred on the north rail about 40 feet east of the switch point at East Garrison. Rail history documentation revealed that the broken rail was 122 lb, rolled in 1980, and manufactured by Bethlehem Steelton. The rail was an “A” rail and the length was 19 feet, 6 inches. The rail section letters were stamped CB and the heat number was 7807. Cross level, gage measurements, and a walking inspection were performed. The cross level measurements east of the POD measured 0 to1/2 inch. Gage measured 56-1/2 to 56-5/8 inches. Cross level west of the POD measured 0 to 1/2 inch. Gage measured between 56-1/2 to 56-3/8 inches. At POD, the cross level measured 1 inch. The ballast was fouled due to heavy mud and water saturation under the crossties. This condition allowed excessive vertical pumping forces of the rail under load. Although the cross level (1 inch) was in compliance with the class of track, FRA believes the excessive pumping action underneath the normal train movement added to failure of the field weld. FRA wrote a defect for a fouled ballast condition. The broken rail was sent to an independent lab for analysis.

The rail analysis report stated that a visual examination of the failed rail revealed a fatigue crack emanating from the toe of a thermite weld, which grew rapidly causing the catastrophic failure. Non-ground excessive weld material was also observed at the toe of the weld. After conferring with the CSX welding manual the engineering company determined the weld was not ground properly and added to the rail failure.

FRA reviewed the last track geometry tests performed in this location. The FRA T-16 Car operated on January 22, 2006, and the CSX Gage Restraint Measurement Car (GRMS) on January 16, 2006. Both survey test car reports revealed no geometry defects. The last scheduled rail test performed in the derailment location by Sperry Rail Service was on December 13, 2005. The assigned rail test car that conducted the test was car No. SRS 832. There were no rail defects found or recorded at that location.

The last track inspection conducted by CSX was January 23, 2006. The track inspection report revealed no defects noted where the derailment occurred.

The event recorder data was downloaded by a CSX road foreman. The analysis disclosed that when the engineer trainee was initially stopped and began moving forward, he was in the No.1 throttle position indicating the engine was loading 344 AMPS, traveling at 3 mph. The engineer applied 11 lbs of reduction (PSI) with the automatic brake. No exceptions were taken.

On January 27, 2006, an FRA follow-up track inspection was conducted at the derailment location. The cross level measured 1/4 inch and the gage was 56-1/2 inches. The track was brought back into compliance with the Federal Track Safety Standards. The rail had been replaced and welded. The mud in the track where the derailment occurred had been removed. CSX engineering forces were dressing the accident location with new ballast and conducting surfacing work. There were no exceptions taken during the reinspection.

Probable Cause and Contributing Factors

As per an investigation by the Federal Railroad Administration the contributing factor was a combination of the saturated mud condition and the 1 inch cross-level deviation causing excessive vertical forces under load, adding damage.

Also, as per the FRA investigation, the probable cause of the derailment was a broken field weld, cause code T204.

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