Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-08

Amtrak (ATK)
Russell, MA
March 8, 2009

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-2009-08

1.Name of Railroad Operating Train #1: Amtrak [ATK]	1a. Alphabetic Code: ATK	1b. Railroad Accident/Incident No.: 111316
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.: R00057726
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 03 | Day 08 | Year 2009	7. Time of Accident/Incident: 02:48:00 ☐ 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	Albany

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
WORONOCO	112.1	N/A	MA	HAMPDEN

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
55 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
Single Main Track	3	40	4

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
2	1	P49908

29. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	31. Method(s) of Operation *(enter code(s) that apply)*	31a. Remotely Controlled Locomotive?
36 MPH — R	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)*	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter
30. Trailing Tons *(gross tonnage, excluding power units)*: N/A	Code(s): d | N/A | N/A | N/A | N/A	0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	ATK-98	2	N/A
(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): Y

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	1	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	0	4	0	0	0
(2) Total Derailed	0	4	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$108,633.00	$3,600.00	T111	T110

Number of Crew Members

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

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 3 Mi 30	Hrs 3 Mi 30

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

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)* R - Recorded E - Estimated — Code	58. Method(s) of Operation *(enter code(s) that apply)*	58a. Remotely Controlled Locomotive?
N/A MPH — N/A	a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track	0 = Not a remotely controlled; 1 = Remote control portable

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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	63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty 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

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	90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty 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

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. 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)* Code N/A

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

109. *geographical)* 1.North 2.South 3.East 4.West Code N/A

Rail Equipment Involved

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

112. Position of Car Unit in N/A

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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

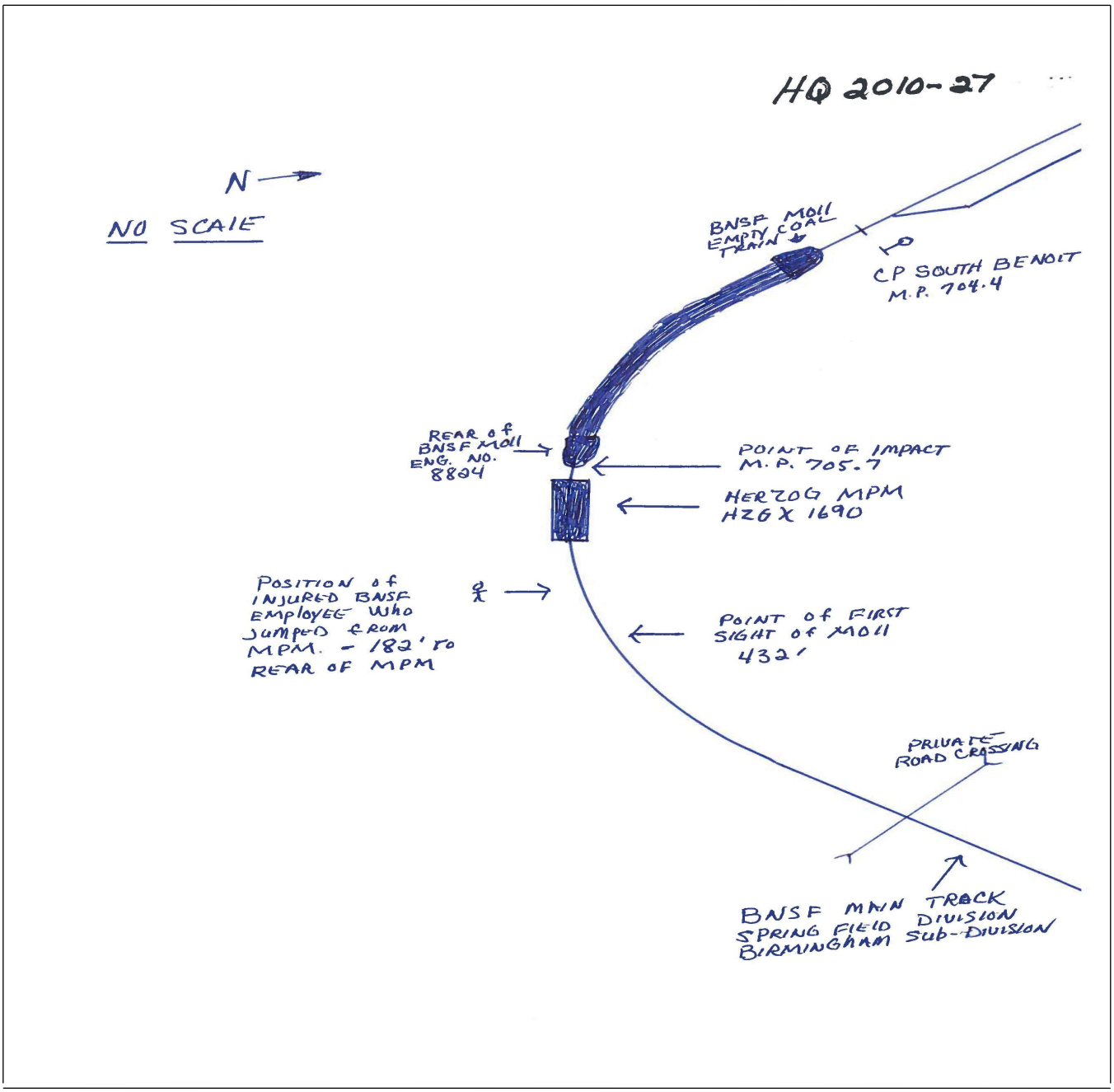
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify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



137. SYNOPSIS OF THE ACCIDENT

Westbound Amtrak (ATK) Passenger Train P499-08 derailed on March 8, 2009, at 2:48 p.m. The derailment occurred near Russell, Massachusetts, at CSX Milepost 112.1 on the CSX Berkshire Subdivision of the Albany Division.

There were no injuries to the train crew or passengers. The lead locomotive did not derail, the second locomotive and 4 trailing coaches derailed all wheels. The ATK equipment sustained about $108,633 in damages and track damages were $3,600.

At the time of the accident it was daylight and clear, the temperature was 55° F.

The probable cause of the derailment was wide gage (T111). Defective crossties and fasteners contributed to the derailment.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

AMTRAK TRAIN P449-08:

The crew of Amtrak Passenger Train P449-08 included a locomotive engineer, a conductor and an assistant conductor. They first went on duty at 11:20 a.m. EDT, March 8, 2008, at Amtrak's South Station in Boston Massachusetts. This was a regular assignment for this crew and all received more than the required statutory off duty rest period prior to reporting for duty.

Amtrak Train P449-08 consisted of two locomotives, one baggage car, two passenger coach cars and one diner car. Amtrak Train P449-08 operates daily with an 11:55 scheduled departure at South Station, Boston, MA, and a 5:35 p.m. en route to Albany NY.

On March 8, 2009, Amtrak Train P449-08 departed Boston on time at 11:55 a.m. ATK Train P449-08 entered the CSX Boston Subdivision at Milepost 1.1 in Boston, Massachusetts. Traveling westward, ATK Train P449-08 made station stops at Framingham and Worcester. Arriving at CP 92, ATK Train P449-08 entered the CSX Berkshire Subdivision in Springfield, MA, continuing westward on the CSX Berkshire Subdivision. ATK Train P449-08 made a station stop at Springfield, MA.

Springfield, MA, was the last station stop for ATK Passenger Train P449-08 prior to the derailment. ATK Train P449-08 departed Springfield station with one locomotive engineer, two conductors, two coach attendants, 107 ticketed passengers, two infants and a CSX Dispatcher who was riding the head end.

As the westbound train approached the derailment location, it entered the Single Main Track at CP 109. The engineer was positioned at the controls of the lead locomotive on the north side. The lead locomotive was off line and ATK Train P449-08 was being powered by the trailing locomotive.

The maximum authorized timetable speed on the single main track between CP 109 and Milepost 112 is 50

mph for both freight and passenger trains. Between Milepost 112 and 113.6, a permanent speed restriction of 40 mph for both freight and passenger trains is in place.

The railroad timetable direction of ATK Passenger Train P449-08 was west. Timetable direction is used throughout this report.

TRACK AT THE POINT OF DERAILMENT (POD):

The point of derailment (POD) was located on a 0.71 ascending grade within a 4 degree 30 minute left hand curve with 3-1/2 inches super-elevation. At the point of derailment, the track was constructed with Pandrol tie plates and screw lag fasteners. The outer rail of the curve was continuous welded rail (CWR), 141 lb RE section laid in 2001. The inner rail was CWR, 132 lb RE laid in 1991.

The fasteners on 13 consecutive crossties immediately prior to the point of derailment had broken allowing wide gage. Four consecutive defective crossties at the point of derailment contributed to the wide gage. The gage measurement 21 feet prior to the POD measured 57-1/4 inches. The gage progressively widened to a loaded gage measurement of 59-3/4 inches at the POD.

The Single Main Track at the POD was inspected by a CSX Track Inspector twice during the week prior to the derailment. No exceptions were noted by the inspector during either inspection. The track at the point of derailment was inspected by CSX Albany Division Engineer and Roadmaster on February 12, 2009, and by CSX Engineer of Track (EOT) on February 18, 2009.

The CSX Berkshire Subdivision was surveyed by a CSX geometry vehicle on December 10, 2008.

THE ACCIDENT

Immediately prior to the derailment, the train had passed Milepost 112, traveled west about 500 feet, and entered a 4 degree 30 minute left hand curve at a recorded speed of 36 mph. At 2:48 p.m., as ATK Train P449-08 passed over the 13 consecutive crossties with broken fasteners at Milepost 112.1, the gage spread to 59-3/4 inches under the trailing locomotive. The engineer felt a jolt, saw ballast dust near the baggage car and heard a noise from the rear of the train. The engineer moved the throttle from the eighth position to the idle position and applied the automatic air brake. The train traveled west about 1,500 feet and came to a stop. The outer rail of the curve was rolled out from the POD to where the equipment of ATK Passenger Train P449-08 stopped. The engineer made an emergency radio transmission and notified the CSX Dispatcher of the derailment.

The lead locomotive did not derail. The trailing locomotive, baggage car, two passenger coach cars, and diner car derailed all wheels. All equipment remained upright and in line with the track. There were no injuries to passengers or crew reported.

Emergency services we notified by the CSX dispatcher and they arrived at the derailment site at 3:15 p.m. All passengers remained on board the train until alternate transportation arrived. All passengers were bused to the next rail station at 6:40 p.m.

ANALYSIS AND CONCLUSIONS

ANALYSIS - EVENT RECORDER DATA:

The relevant event recorded data was downloaded at the derailment site by an Amtrak Staff and the CSX Road Foreman of Engines. The speed at the point of derailment was recorded at 36 mph. The authorized posted train speed was 40 mph. At 3 inches of cant deficiency, a maximum speed of 45 mph is allowed in 4 degree 30 minute curvature with 3-1/2 inches super-elevation. The equipment, of ATK Train P449-08, is qualified at 4 inches of cant deficiency allowing a speed of 49 mph.

CONCLUSION: Amtrak Train P449-08 was in compliance with the CSX's posted speed of 40 mph. Train speed did not contribute to the derailment.

Post-accident toxicology testing was not preformed on any of the crew members of Amtrak Passenger Train

P449-08.

The Federal Track Safety Standards require that Class 3 track for passenger trains be inspected twice weekly with at least one calendar day between inspections. CSX's track inspection records were reviewed for the 3 month period preceding the derailment and indicated that CSX was in compliance with their track inspection frequency.

The Federal Track Safety Standards require that the gage on Class 3 track does not exceed 57-3/4 inches. The gage at the point of derailment measured 59-3/4 inches. CSX was in violation of the Federal Track Safety Standards, 49 CFR, Part 213.53 (Gage).

CONCLUSION:

This derailment was caused by a wide track gage (T111). Track measurements of 59-3/4 inches existed at POD. The four consecutive defective crossties at the point of derailment and broken lag screws on the 13 consecutive crossties preceding the point of derailment contributed to the wide gage.