Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-01

Union Pacific Railroad Company (UP)
Lusk, WY
January 1, 2008

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-2008-1

1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP]	1a. Alphabetic Code: UP	1b. Railroad Accident/Incident No.: 0108NP001
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: Union Pacific RR Co. [UP]	4a. Alphabetic Code: UP	4b. Railroad Accident/Incident No.: 0108NP001
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 01 Day 01 Year 2008	7. Time of Accident/Incident: 12:40:00 ☑ 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	0	0	0	North Platte

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Lusk	234.2	N/A	WY	NIOBRARA

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
11 F	4	6	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
Main Track 2	4	223.0	3

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
1	1	CBMNN-31

29. Speed *(recorded speed, if available)* R - Recorded E - Estimated: 34 MPH — Code: R

30. Trailing Tons *(gross tonnage, excluding power units)*: 16445

31. 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

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

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	MBKX6399	32	yes
(2) Causing *(if mechanical cause reported)*	N/A	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
0	0

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

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	1
(2) Total Derailed	0	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	115	0	0	0	0
(2) Total Derailed	32	0	0	0	0

37. Equipment Damage — This Consist: $2,670,562.00

38. Track, Signal, Way, & Structure Damage: $211,213.00

39. Primary Cause Code: T214

40. Contributing Cause Code: N/A

Number of Crew Members

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

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 5 Mi 20	Hrs 5 Mi 20

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: 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 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: 0 MPH — Code: N/A

58. 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

58a. Remotely Controlled Locomotive? 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)*	0	0	N/A
(2) Causing *(if mechanical cause reported)*	0	0	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
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. 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

64. Equipment Damage This Consist $0.00

65. Track, Signal, Way, & Structure Damage $0.00

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
0	0	0	0

Length of Time on Duty

72. Engineer/Operator Hrs 0 Mi 0

73. Conductor Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

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 0

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)*	0	0	N/A
(2) Causing *(if mechanical cause reported)*	0	0	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
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

90. 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

91. Equipment Damage This Consist $0.00

92. Track, Signal, Way, & Structure Damage $0.00

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
0	0	0	0

Length of Time on Duty

99. Engineer/Operator Hrs 0 Mi 0

100. Conductor Hrs 0 Mi 0

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	0	0	0
Nonfatal	0	0	0

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 0

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

113. Circumstance	Code
1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	N/A

114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?	Code
1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A

114b. Was there a hazardous materials release	Code
1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A

114c. State here the name and quantity of the hazardous materials released, if any.
N/A

115. Type Crossing Warning	1.Gates	4.Wig Wags	7.Crossbucks	10.Flagged by crew
	2.Cantilever FLS	5.Hwy. traffic signals	8.Stop signs	11.Other *(spec. in narr.)*
	3.Standard FLS	6.Audible	9.Watchman	12.None

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

116. Signaled Crossing *(See instructions for codes)*	Code
	N/A

117. Whistle	Code
1. Yes 2. No 3. Unknown	N/A

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

119. Crossing Warning with Highway Signals	Code
1. Yes 2. No 3. Unknown	N/A

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

121. Age	122. Driver's Gender	Code
0	1. Male 2. Female	N/A

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

124. Driver	Code
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

125. Driver Passed Highway Vehicle	Code
1. Yes 2. No 3. Unknown	N/A

126. View of Track Obscured by *(primary obstruction)*	Code
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

Casualties to:	Killed	Injured
129. Highway-Rail Crossing Users	0	0

127. Driver	Code
1. Killed 2.Injured 3. Uninjured	N/A

128. Was Driver in the Vehicle?	Code
1. Yes 2. No	N/A

130. Highway Vehicle Property Damage *(est. dollar damage)*
0

131. Total Number of Highway-Rail Crossing Users *(include driver)*
0

132. Locomotive Auxiliary Lights?	Code
1. Yes 2. No	N/A

133. Locomotive Auxiliary Lights Operational?	Code
1. Yes 2. No	N/A

134. Locomotive Headlight Illuminated?	Code
1. Yes 2. No	N/A

135. Locomotive Audible Warning Sounded?	Code
1. Yes 2. No	N/A

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

Union Pacific Railroad

North Platte Service Unit

Powder River Subdivision

Milepost 234.2

Derailment

January 1, 2008

NOT TO SCALE

N

Shawnee Junction
271.48

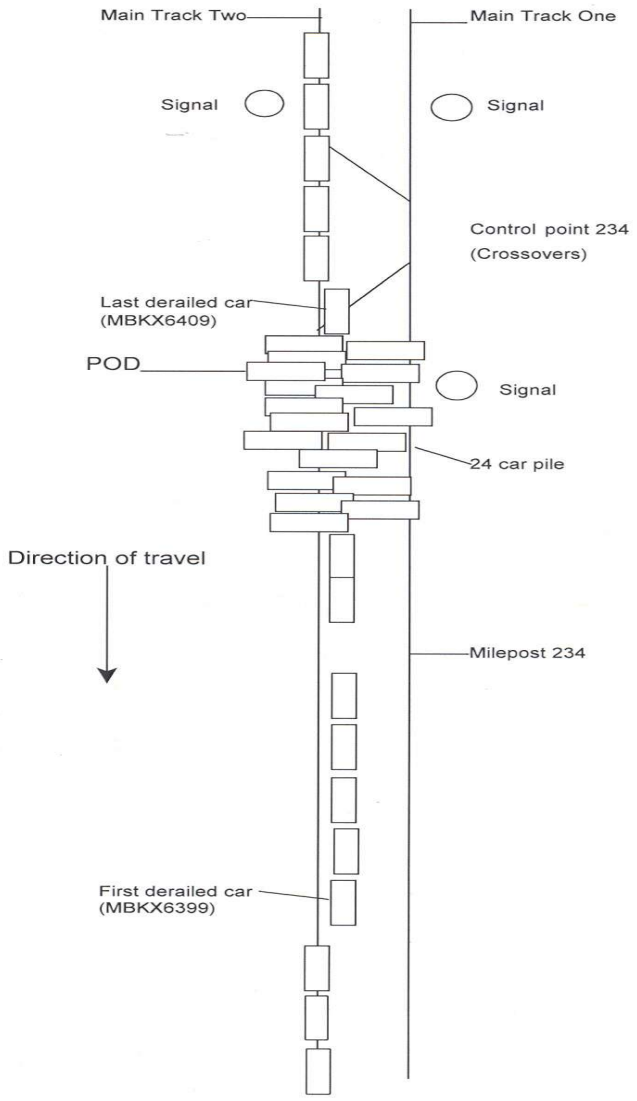
Lost Springs
259.8

Manville
244.1

Lusk
235.77

POD
234.2

Crandall
220.30



137. SYNOPSIS OF THE ACCIDENT

On January 1, 2008, at 12:40 a.m.MST, an eastbound Union Pacific Railroad (UP) coal train, symboled CBMNN-31 derailed 32 cars on the North Platte Area, Powder River Subdivision at milepost 234.2 near the town of Lusk, Wyoming. The train was traveling on Main Track No. 2 at a recorded speed of 34 mph. The maximum authorized timetable track speed for loaded coal trains in the area of the accident is 40 mph.

The train consisted of three locomotives, 115 rail cars, 16,445 trailing tons and was 6,434 feet in length. Two of the locomotives were located at the leading end of the train with one distributed power (DP) locomotive located on the rear of the train. A total of 32 cars, the 32nd through 63rd, derailed. There were no injuries reported and no release of hazardous material. The estimated damage of the derailment was $2,881,774 ($2,670,562 for equipment and $211,213 for track and signal).

At the time of the derailment it was dark and snowing. The temperature was 11° F.

The probable cause of the accident was T214-Joint bar broken (insulated).

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On December 31, 2007, after completing more than the required statutory off duty rest period, a crew consisting of an engineer, student engineer and conductor first went on duty at their away from home terminal at Bill, Wyoming at 7:20 p.m. The crew was assigned to operate an eastbound UP unit coal train, symboled CBMNN-31, from Bill, WY to South Morrill, Nebraska.

The train consisted of three locomotives, 115 rail cars, 16,445 trailing tons and was 6,434 feet in length. The train had received a Class IA air brake test inspection on December 27, 2007 at South Morrill. After a job briefing the engineer made sure the locomotives daily and periodic inspections were compliant. The crew boarded the train and the student engineer conducted an air brake continuity check before departing from Bill at 9:15 p.m. on December 31, 2007.

The train approached the derailment area traveling geographically and timetable east (Timetable directions will be used throughout the report). The student engineer was seated at the controls on the right (south) side of the locomotive cab and the engineer was located in the center of the locomotive cab standing next to and instructing the student engineer. The conductor was seated in his seat on the left (north) side of the locomotive cab.

Approaching the accident site from the west at about milepost 235.0 and traveling eastward on Main Track 2, the train was exiting a 1-degree 34-minute curve to the right about 1,000 feet in length which was proceeded by tangent track about 4,000 feet in length to the point of derailment (POD) with 5,280 feet of tangent track beyond. The grade of track is on a 0.4-percent descending at the POD.

According to the crew, as the train approached the accident area, the trip was uneventful.

THE ACCIDENT

As the train approached the accident site and at the time the accident occurred, the train was being operated at 34 mph. The speed was recorded by the event recorder of the controlling locomotive and the distributive power locomotive at the rear of the train. In the accident area, trains operate on double main tracks under the authority of a Traffic Control System (TCS) controlled by a dispatcher located in Omaha, Nebraska. The maximum authorized speed for freight trains in the accident area is 60 mph as designated in the UP North Platte Area Timetable No. 3, effective July 30, 2007. Powder River Subdivision General Order Number 1, effective July 29, 2007 restricts all loaded coal trains on the Powder River Subdivision to operate at 40 mph. According to the train crew, as the train passed over the east switch at Control Point (CP) 234 (234.2) with the locomotives operating in a light dynamic brake setting and the train's air brakes released, the crew felt an unusually rough spot on the track. Thirty car lengths after the rough track, the crew experienced a slight acceleration immediately followed by a train line induced emergency air brake application. The conductor was in the process of contacting the UP dispatcher to report the rough track condition when the train line induced emergency air brake application occurred. The UP dispatcher acknowledged the conductors call, then the conductor announced emergency over the radio to any trains approaching their position on Main Track 1. The dispatcher then reported to the train crew that he had lost power at CP 234 and after the train came to a stop the conductor left the locomotive to investigate and observed a portion of the train had been derailed.

ANALYSIS AND CONCLUSION

The accident met the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing and the crew was tested. The test results were negative.

The investigation revealed the last track side detector the train cleared was a hot wheel and dragging equipment detector located at milepost 235.8. The conductor said the detector gave an exit message of "no defects". The conductor also confirmed that all track side defect detectors had worked properly from Bill to the POD and that the train had cleared each detector without defects.

The analysis of the event recorder downloads from the lead and DP locomotives, revealed no excessive in-train forces and compliance with all UP Air Brake and Train Handling Rules prior to and during the derailment.

ANALYSIS: FATIGUE

FRA obtained fatigue related information, for the 10-day period preceding this incident including the 10-day work history (on duty/off duty cycles) for all of the employees involved.

CONCLUSION:

Upon analysis of that information FRA concluded that one or more of the employees may have been working at a diminished level of safety (effectiveness) due to mental and/or physical attributes associated with fatigue, however this condition would not have contributed to the cause of an accident.

ANALYSIS - TRACK CONDITIONS:

FRA investigators inspected UP track inspection records for the prior two months leading up to the time of the derailment. The inspection did not reveal any FRA defective track conditions being discovered in the accident area. The last track inspection performed in the accident area was on December 31, 2007.

FRA investigators also inspected the last defective rail inspection reports done on October 29, 2007, and the last geometry car inspection reports done on September 18, 2007, and both defective rail and geometry reports reflected no FRA defective conditions noted in the accident area.

During the investigation, two rail end sections and one broken insulated rail joint bar from the insulated rail joint was recovered at the POD (234.2). One end of the broken angle bar was sent to a laboratory for analysis. The broken insulated joint was located on the north rail at the east signal of CP 234 (234.2), Main Track 2. Each member of the train crew interviewed, acknowledged unusually rough track at this location prior to the train derailing. The train entered CP 234 on a clear signal indication. None of the previous trains had reported rough track at this location.

The two locomotives on the lead consist and 29 loaded coal hoppers passed over the insulated joint before cars in the 32nd though 63rd position in the train derailed. The first car to derail was the MBKX6399, located at the 32nd position from the leading end of the train. There was a gap of about 250 feet between the cars in the 31st and 32nd positions. The 32nd through 36th cars derailed to the north of Main Track 2, rolling onto their sides and blocking Main Track 1. There was a gap of about 250 feet between cars in the 36th and 37th positions. The 37th and 38th cars also came to rest on their side, falling to the north of Main Track 2. The cars in the 39th through 62th position in the train were in a pile about 700 feet long, directly west of the 38th car. The last car to derail, MDKX6409, was in the 63rd position of the train and located at the switch points of the east crossover switch on Main Track 2, directly behind the 24 car pile. Main Track 2 was destroyed and had to be replaced from the switch points of the east switch to a point about 700 feet east on this location. The east signal, governing eastward movement at CP 234 on Main Track 2 was also destroyed along with the power machine for the dual control east switch.

The investigation revealed the two locomotives and 29 rail cars that made it over the derailment had no mechanical issues but the cars that made it over the POD without derailing were found to have marks on the north-side wheels consistent with marks made from a broken rail or an open rail joint that allows the rail ends to move laterally and vertically striking the rail wheels on account of the rail ends are no longer restrained in the insulted rail joint bar(s).

PROBABLE CAUSE:

The FRA and UP investigation revealed the probable cause of the accident was T214 Joint bar broken (insulated).