Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-79

Burlington Northern Santa Fe
Cactus, TX
October 9, 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-2006-79

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: PR1006100
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: BNSF Rwy Co. [BNSF]	3a. Alphabetic Code: BNSF	3b. Railroad Accident/Incident No.: PR1006100
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 10 / Day 09 / Year 2006	6. Time of Accident/Incident: 07:30: ☐ 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): 12

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
2	2	0	0	Colorado

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Cactus	64.6	N/A	TX	MOORE

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
43 F		3		2		3

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
North Storage Track		1	0		2

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
		1	1	1	CCAM SLP152

28. Speed (recorded speed, if available) R - Recorded E - Estimated			Code	30. Method(s) of Operation (enter code(s) that apply)			30a. Remotely Controlled Locomotive?
E	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; 2. South 4. West; 3 = Remote control transmitter - more than one remote control transmitter: 0

29. Trailing Tons (gross tonnage, excluding power units): 16918

Code(s): j | N/A | N/A | N/A | N/A

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)	0	0	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	2	0	0	0	2
(2) Total Derailed	2	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	128	0	0	0	0
(2) Total Derailed	17	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
1595400	133000	H702	H405

Number of Crew Members 40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen	Length of Time on Duty 44. Engineer/Operator	45. Conductor
N/A	0	1	0	Hrs 9 Mi 30	Hrs 9 Mi 30

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: 1

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

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
		6	1. Yes 2. No	2	N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated			Code	57. Method(s) of Operation (enter code(s) that apply)	57a. Remotely Controlled Locomotive?
E	0	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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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			j 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)	NDYX4 75171	1	no		N/A	N/A
(2) Causing (if mechanical cause reported)	0	N/A	N/A	60. Was this consist transporting passengers? (Y/N)		N

61. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote	62. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	4	0	53	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	9	0	0

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
320279	0	H702	N/A

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators N/A	68. Firemen N/A	69. Conductors N/A	70. Brakemen N/A	71. Engineer/Operator Hrs 0 Mi 0	72. Conductor Hrs 0 Mi 0

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

76. EOT Device? (1. Yes 2. No)	77. Was EOT Device Properly Armed? (1. Yes 2. No)	78. Caboose Occupied by Crew? (1. Yes 2. No)
N/A	N/A	N/A

Highway User Involved

79. Type	Code
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)	N/A

80. Vehicle Speed (est. MPH at impact)	81. Direction geographical) 1.North 2.South 3.East 4.West	Code
N/A		N/A

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

86a. 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

Rail Equipment Involved

83. Equipment	Code
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)	N/A

84. Position of Car Unit in Train
N/A

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

86b. Was there a hazardous materials release by	Code
1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A

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)	N/A	N/A		N/A		N/A	N/A			N/A		N/A

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

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

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

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

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

93. Driver's Age	94. Driver's Gender 1. Male 2. Female	Code
0		N/A

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

96. 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

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

98. 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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	0	0

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

102. Highway Vehicle Property Damage (est. dollar damage)
0

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

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

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

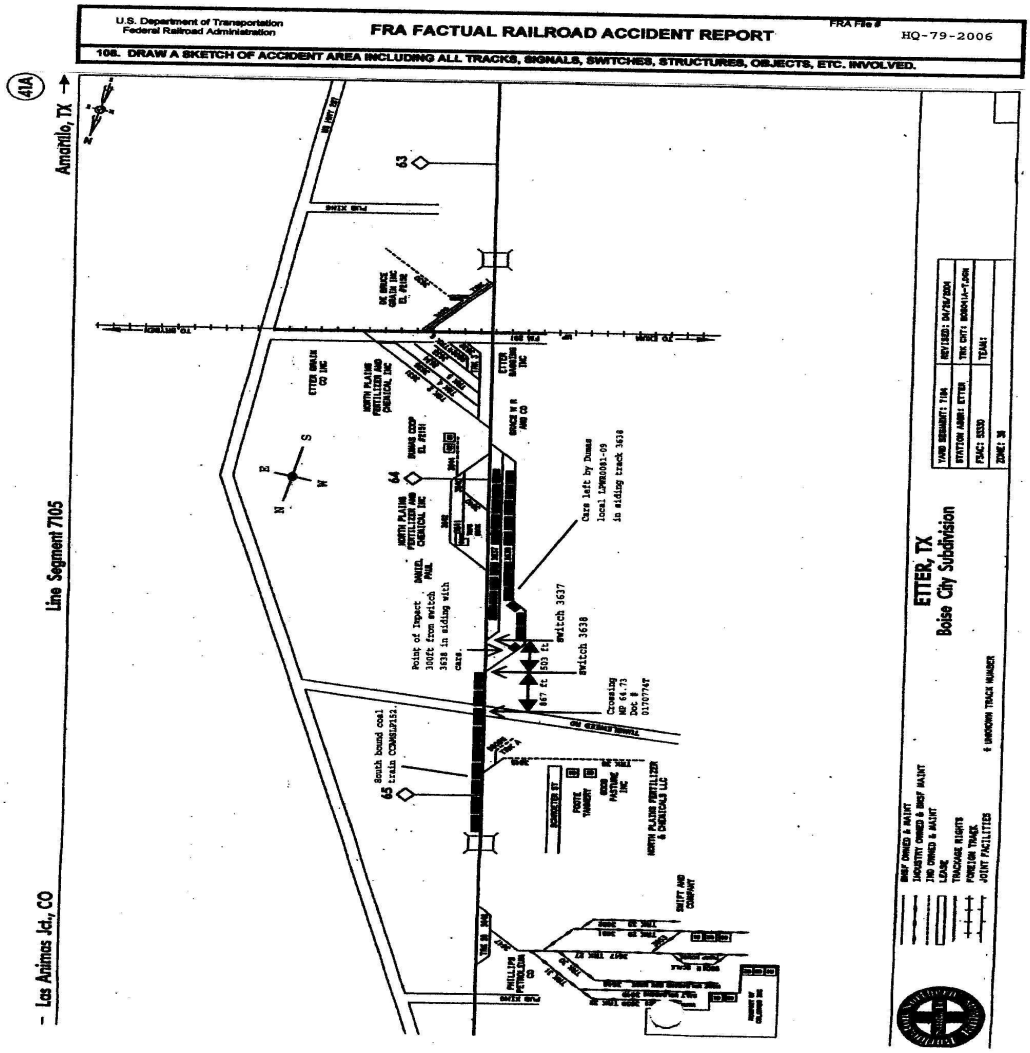
105. Locomotive Auxiliary Lights Operational?	Code
1. Yes 2. No	N/A

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

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

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

HQ-79-2006.jpg



109. SYNOPSIS OF THE ACCIDENT

BNSF train CCAMSLP152 was traveling south bound on single main track on the Boise City subdivision, under track warrant 6555. The south bound coal train found open north storage track switch north of Etter resulting in train impacting 57 cars previously spotted at that track by the local train LPWR0081-09. This impact resulted in the derailment of a total of 2 locomotives, 17 loaded coal cars, and 9 empty cars that were located in the siding, two of which were empty hazardous material cars.

This occurred on October 09, 2006 at approximately 7:30 p.m. central standard time (CST). The weather was cloudy, dusk, and 43 degrees. Location of the accident occurred north of Etter, siding north storage track 3638, mile post 64.6. The siding is located in the city of Cactus, TX one quarter of a mile west of highway 287.

There were no fatalities. Engineer and conductor sustained non-life threatening injuries in the nature of head lacerations and bruises. Both taken to Dumas Memorial Hospital and then later released.

A total of 27 cars derailed and 2 locomotives with estimated damages at approximately $ 2,048,679 for rail equipment and track damage, not including clearing cost of $127,000.

110. NARRATIVE

Circumstances Prior to the Accident

Local LPWR0081-09 South
The crew of local freight train LPWR0081-09 South included a locomotive engineer, a conductor, and a brakeman. They went on duty at 6:00 AM, CST, October 9, 2006, at BNSF South Yard office terminal in Amarillo, TX. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty. The crew dead headed from the terminal to Dumas, TX depot office where work orders were picked up and then continued on in the taxi to the train located at Kerrick MP 100.1, just north of Stratford, TX.

Their assigned freight train consisted of three locomotives, 8 loaded, and 107 empty cars of numerous varieties. The train was 6833 feet long, and weighed 4678 tons. The train was scheduled to travel from Kerrick to Amarillo TX with cars to be set out at Stratford, TX and Cactus TX, tracks 3638/3637/3640. After setting out cars at Cactus TX train continued on to Dumas depot office to pick up track warrant and continue on into Amarillo, TX where crew tied up at 6:00 PM.

Freight CCAMSLP152 South
The crew of the south bound coal train, CCAMSLP152, included a locomotive engineer and a conductor. They went on duty at 9:00 AM, mountain standard time (MST), October 9, 2006, at BNSF La Junta, CO. This was the away from home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty.

Their assigned coal train consisted of four locomotives, which include two DPU, 128 loaded, and 0 empty cars. The train was 6795 feet long, and weighed 6918 tons. The train was scheduled to travel to Amarillo, TX, with no cars to be added or removed en route. The train was checked over by the engineer and departed La Junta at approximately 9:45 AM MST.

As the south bound coal train approached the accident area, the locomotive engineer was seated at the controls on the west side of the cab of the leading locomotive. The conductor was seated on the east side of the cab of the leading locomotive.

In this area of the railroad there is single main track with track warrant type of operation, non-signal territory. There is no curve in the track as one passes the grade crossing, Tumbleweed road, and continues south 1167 feet to the point of the accident, 300 ft past main track switch 3638. There is a 0.59 percent descending grade. In this area is the town of Cactus, TX and State Highway 287 that runs parallel to the track, approximately a quarter mile to the east of the main track. Traveling north to south on the highway, the grade is practically level.

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

The Accident

The south bound coal train, CCAMSLP152, having just past the crossing at Tumbleweed road, MP 64.73, was operated at approximately 36 mph approaching the accident area. The train crew's view of the track ahead was not obstructed, it was dusk, and rain had fallen earlier in the area to make the rail lightly wet. The engineer had released the brakes and got into the throttle more gradually than at other times due to the wet rail. As the crew cleared the crossing gates at Tumbleweed road the trained continued to travel south on the track approximately 800 ft before realizing the main track switch 3638 was lined in the reverse position. The engineer and conductor observed the reverse switch target simultaneously and called it out in unison and the engineer moved the automatic brake lever to emergency. Both the engineer and conductor got down as low as possible on the floor of the cab and braced for impact with the cars in the siding. The train had

slowed to 32 mph when the collision occurred. The speeds were recorded by the event recorder of the second locomotive due to the severe damage on the leading locomotive. The maximum authorized speed for this train was 49 mph, as designated in the current BNSF timetable No. 7.

The train struck the standing set of 53 cars in the side track, 3638, at approximately 1167 feet from the grade crossing Tumbleweed road at approximately 7:30 PM CST. The train continued south on track 3638 through the set of standing cars for about 500 feet coming to rest on the southwest side of the track leaving the lead locomotive on its side and second unit upright. This impact resulted in the derailment of a total of 2 locomotives, 17 loaded coal cars, and 9 empty cars that were located in the siding, two of which were empty hazardous material cars.

After the train came to a stop the lead locomotive was on its side with the engineer and conductor still in the cab but on top of each other from the collision. The conductor was able to squeeze through the front window and drop to the ground and walk to the second unit, still upright, and call for help, 911. After reaching emergency help the conductor walked back to lead unit and climbed up on the engineer's door where he was able to pry the door open with his body and help the engineer out onto the ground. The train service crew then walked back up the west side of the track for approximately 200 yards to where they could cross over through the cars on the main to the east side of the track where emergency personnel were waiting. Separate ambulances took both engineer and conductor to local Dumas hospital for treatment. The engineer received treatment and was released while the conductor was moved onto Amarillo Northwestern hospital for further treatment and observation.

The engineer and conductor are presently at home on company leave recovering from injuries.

Analysis and Conclusions

Analysis

The south bound local train, LPWR0081-09, set out cars for the north storage track 3638 at approximately 1:00 PM CST. The engineer, conductor, and brakeman had a job brief instructing the brakeman to notify crew when clear of derail and then line main line switch and derail back to normal position. After local cleared into track 3638 conductor picked up ETD, lined derail to normal position, and then watch shove down adjacent track 3637. The conductor failed to line main line track switch 3638 back to normal in non-signal territory. After completing set outs in the tracks at Cactus engineer and conductor picked up brakeman and completing a job brief on finished worked continued on south towards Dumas TX. After stopping briefly at the Dumas depot office the local picked up a track warrant from the printer and then continued on toward Amarillo TX. At 2:52 PM CST the conductor contacted the Boise City sub dispatcher and cleared track warrant 6555, but cleared warrant with out required briefing concerning main line switches of the conductor and dispatcher. Also switch position form being used by engineer and conductor was not initialed properly by both engineer and conductor and not signed by the conductor. The local crew completed their job assignment and tied up at 6:00 PM CST at Amarillo TX.

The south bound coal train, CCAMSLP152, as a result of the local, LPWR0081-09, failure to line main line track switch 3638 in normal position in non-signal territory traveled into the north storage track and struck the standing cut of cars and derailed. The railroad collected samples as require by FRA's post-accident toxicological test requirements from the engineer and conductor, of the CCAMSLP152. The results of the test, both alcohol and drug, showed negative for both crew members. No post-accident toxicological test were done on the local crew, LPWR0081-09, due to the covered employees were already released from duty. No evaluation of the lead locomotive, of the CCAMSLP152, were performed by BNSF. The download and the analysis of the recorder data was performed by BNSF on the second locomotive due to the severity of the damage and unable to use the recorder on the lead locomotive. The south bound coal train, CCAMSLP152, was equipped with a speed indicator and event recorder as required. The relevant event recorder data was downloaded from the second unit and analyzed by the Road Foreman Colorado division at Amarillo TX. The analysis disclosed that the locomotive engineer was in compliance with railroad operating and train handling requirements there on the Boise City Subdivision. The FRA reviewed the results of this analysis, and concurred with the conclusions. Also the lead unit, BNSF 5942, of the south bound coal train was equipped with an on board camera. The down load from the camera was analyzed by the Road Foreman Colorado division at Amarillo TX and showed that the main line switch in non-signaled territory 3638 was lined and locked for other than main line movement. The FRA reviewed the camera down load and concurred with observations and conclusions concerning video down load. There was no FRA test done on track or locomotive equipment but visual inspection of accident area, siding, and equipment were done at accident site as well as accident photographs.

Conclusion

The railroad was not in compliance with Federal Railroad Administration Emergency Order 24. The local train crew, LPWR0081-09, and Boise City Subdivision dispatcher was in violation of Emergency Order 24 in the following areas:
engineer failed to correctly fill out the switch position form correctly, conductor failed to correctly fill out switch position form correctly as well as improperly cleared track warrant 6555 by not reporting to the train dispatcher that all hand-operated main track switches in non-signaled territory had been restored to their normal position, brakeman failed to properly restore the main line switch to normal position in non-signal territory, and the dispatcher failed to confirm the switch positions with the employee before clearing the limits of track warrant 6555 that covered the main track in non-signal territory.

Probable Cause & Contributing Factors

The FRA investigation found the contributing factor to be incorrectly filling out of switch position forms of both engineer and conductor, improper release of track warrant by conductor, and dispatcher's failure to confirm the switch positions with employee. (H405)
The FRA investigation revealed that the accident occurred as a result of the failure of the brakeman to restore main line switch to normal position in non-signal territory. (H702)