Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-50

Burlington Northern Santa Fe (BNSF)
Mammoth, AZ
June 3, 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-2008-50

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: SF0608100
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: BNSF Rwy Co. [BNSF]	4a. Alphabetic Code: BNSF	4b. Railroad Accident/Incident No.: SF0608100
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 06 | Day 03 | Year 2008	7. Time of Accident/Incident: 03:35: ☑ 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: 12

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
13	1	1	0	Springfield

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Mammoth, Springs	342.4	N/A	AR	FULTON

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
73 F	4	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	75.06	1

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	2	HMEMKCK102

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?
28 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)*: 4387

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

31a. Remotely Controlled Locomotive?: 0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	BNSF793328	83	yes
(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	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	4	0	0	0	0
(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	24	0	55	0	0
(2) Total Derailed	4	0	11	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$373,622.00	$102,723.00	H021	H008

Number of Crew Members

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

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 3 Mi 5	Hrs 3 Mi 5

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: 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
	1	2	VBIRRIC801

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?
0 MPH	R	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

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2008-50

57. Trailing Tons *(gross tonnage, excluding power units)*: 4460

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): e | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: 0

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	BNSF5322	1	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

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	2	0	0	0	0	(1) Total in Equipment Consist	55	0	0	0	0
(2) Total Derailed	1	0	0	0	0	(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: $20,000.00

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

66. Primary Cause Code: H021

67. Contributing Cause Code: H008

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
1	0	1	0

Length of Time on Duty

72. Engineer/Operator: Hrs 3 Mi 45

73. Conductor: Hrs 3 Mi 45

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	1	0	0

77. EOT Device? 1. Yes 2. No: 1

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

79. Caboose Occupied by Crew? 1. Yes 2. No: 2

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: 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	90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	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. 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)*

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

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

Rail Equipment Involved

111. 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)*

112. Position of Car Unit in: 0

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2008-50

110. Position	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A	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? 1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A	114b. Was there a hazardous materials release 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	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					

116. Signaled Crossing *(See instructions for codes)*	Code	117. Whistle Ban 1. Yes 2. No 3. Unknown	Code
	N/A		N/A

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code
	N/A		N/A		N/A

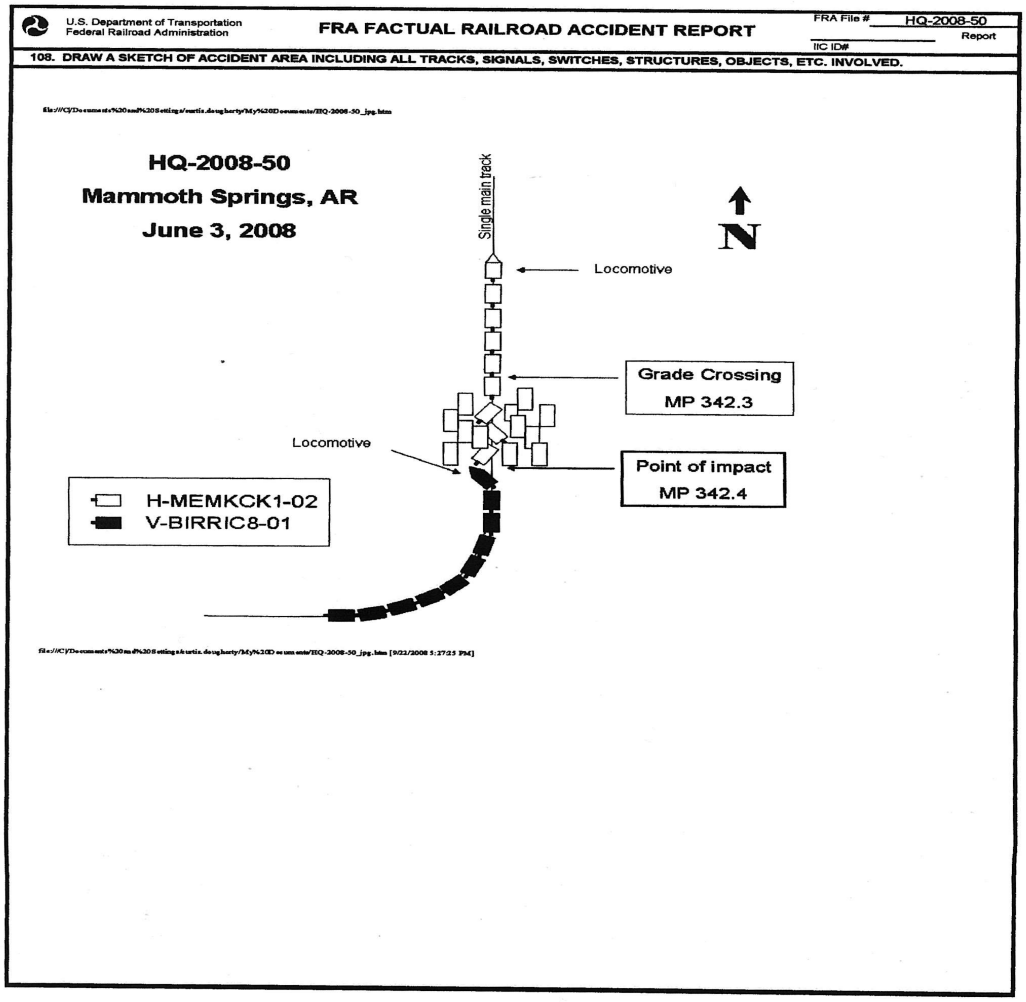
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)*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

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

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				N/A		N/A
129. Highway-Rail Crossing Users	0	0	130. Highway Vehicle Property Damage *(est. dollar damage)*	0	131. Total Number of Highway-Rail Crossing Users *(include driver)*	0

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code
	N/A		N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code
	N/A		N/A

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



137. SYNOPSIS OF THE ACCIDENT

On June 03, 2008 at 3:35 a.m. CST timetable northward Burlington Northern Santa Fe Railway Company (BNSF) freight train H-MEMKCK1-02 rolled unmanned, southward, and collided with stopped timetable northward BNSF train V-BIRRIC8-01. The accident occurred on the north side of Mammoth Springs, Arkansas near mile 342.4 on the BNSF Springfield Subdivision.

The train crew of H-MEMKCK1-02 detached the lead locomotive from the train without securing the remaining portion. The remaining portion consisting of 4 locomotives and 79 rail cars rolled south for 6.08 miles and struck BNSF stopped train V-BIRRIC8-01. The crew of the struck train had been warned and had evacuated the immediate scene just prior to the collision.

As a result of the collision, 15 cars on striking train H-MEMKCK1-02 derailed. The lead locomotive only of struck train V-BIRRIC8-01 derailed.

Approximately 22,000 pounds of solid Ammonium Nitrate Fertilizer were released from a derailed and damaged covered hopper rail car of the striking train.

Approximately 360 gallons of diesel fuel were released as a result of damages to a refrigeration car on the striking train.

There was no evacuation or fire.

One crew-member of BNSF struck train V-BIRRIC8-01 requested an ambulance due to elevated anxiety.

The carrier reported $373,622 equipment damages on the striking train, $20,000 equipment damage on the struck train, and $102,723 in track damages.

At the time of the accident it was dark and clear. The temperature was 73 F.

Toxicological testing of the offending train crew members was negative.

The cause of the accident was failure to secure an unattended train.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

STRIKING TRAIN BNSF H-MEMKCK1-02:

The crew of BNSF Train H-MEMKCK1-02 consisted of one locomotive engineer and one conductor. The on duty time for both crew members was 12:30 a.m. CDT, June 03, 2008. The on duty point was Thayer, MO. This is the away from home terminal for both crew members. Their home terminal is Springfield, MO. Both crew members received more than the required statutory off-duty rest period prior to reporting for duty.

The train consisted of 5 locomotives, 24 loaded rail cars, 55 empties, with 4,388 trailing tons and was 5216 feet in length. There were no distributed power locomotives in the train. The initial terminal for the train was Memphis, TN. A Class 1 air brake test was performed at the initial terminal which included testing of the regulatory required two way functionality of the End of Train Device (EOTD).

The crew was transported from the motel in Thayer, MO to the on duty location at the depot in Thayer, MO. Upon commencing duty the crew received the required paperwork and talked to the train dispatcher. The crew was then transported to their train. The train was properly secured at control point 335.1. It was sitting on timetable southward grade. The grade averaged about 1.25 % over the length of the train.

Upon the crew's arrival at the train the conductor released 15 hand brakes on the cars and five hand brakes on the locomotives. The engineer stated the lead locomotive was the only locomotive in operating status (on line) and went through the rest of the locomotive consist to bring the other four locomotives on line.

When an attempt to bring the other locomotives on line failed, the engineer contacted the mechanical desk and informed them of the problem. The mechanical desk instructed the engineer in trouble shooting procedures of the locomotive consist. The engineer completed the trouble shooting procedures but failed to clear the alarms and bring all of the locomotives to operational status. The crew then contacted the dispatcher and requested that a mechanical rapid response crew be dispatched to the location of the train to assist fixing the locomotives. The crew was informed that the mechanical response crew was too far away to assist.

Because all of the locomotives could not be brought on-line, the engineer requested additional power be provided. And the train dispatcher informed the crew that the Thayer switch crew would bring two locomotives to add to the train. T he engineer planned to add the two locomotives behind the lead locomotive. This required that the lead locomotive be detached from the train and moved past Control Point (CP) 335.1 so the Thayer switcher could place the additional locomotives on the train.

Just prior to the incident the engineer was on the ground preparing to detach the lead locomotive by disconnecting hoses and operating the uncoupling lever. The conductor was in the cab of the locomotive being detached.

STRUCK TRAIN BNSF V-BIRRIC8-01:

The crew of BNSF Train V-BIRRIC8-01 consisted of one locomotive engineer and one conductor. The crew first went on duty at 11:50 p.m. (CDT), June 02, 2008 at the BNSF yard office in Thayer, MO. This is the home terminal for both crew members. Both crew members had received more than the required statutory off -duty rest period prior to reporting for duty. This crew was called to relieve BNSF Train V-BIRRIC8-01 crew at mile 368.0 near Wilford, AR.

This train consisted of 2 locomotives, 55 loaded rail cars, 0 empties, with 4,460 tons, and was 5480 feet in length. Just prior to the accident the engineer and conductor were operating the train from their respective positions in the cab of the lead locomotive.

THE ACCIDENT

STRIKING TRAIN BNSF H-MEMKCK1-02:

The locomotive engineer closed the brake pipe valve between the lead locomotive and the rest of the train. He then detached the lead locomotive from the train without ensuring that the remaining part of the train had been re-secured. As a result, the remaining unmanned part of the train, consisting of 4 locomotives and 79 cars, began to roll freely in a southward direction.

The engineer notified the Thayer, MO Switch Crew and Thayer depot personnel of the roll away. The engineer instructed the conductor to ride the leading end of the remaining locomotive as he attempted to catch the roll away. The movement continued for about 2 miles before stopping and returning to Thayer. The train dispatcher notified the northbound BNSF Train V-BIRRIC8-01 of the runaway with instructions to stop their train and get to a safe location. The unmanned movement of train BNSF H-MEMKCK1-02 continued for 6.06 miles; reaching a recorded speed of 43 mph before striking BNSF V-BIRRIC8-01 at about mile 342.4. The speed at impact was recorded as 28 mph.

During the roll away the unmanned train negotiated southward descending an average grade greater than 1% for the first 3 miles. The grade then moderated but continued generally descending until the point of impact. The estimated average grade traversed to impact is approximately .7%.

Event recorder data indicates the train brakes remained applied up to the point of impact. Numerous sharp curves were traversed which also served to limit maximum attained speed. Four loaded and 11 empty rail cars of this train derailed. One of the loaded rail cars was a covered hopper rail car containing Solid Ammonium Nitrate Fertilizer. Approximately 22,000 lbs of the fertilizer was spilled.

The first car striking the standing train was a refrigerated box car. About 360 gallons of diesel fuel used to power the refrigeration unit was spilled from the car. There were no other hazardous material cars derailed or

damaged. There was no evacuation ordered and no fire ensued. There were no injuries reported.

STRUCK TRAIN BNSF V-BIRRIC8-01:

As the train preceded north approaching the point of impact the crew received a radio communication from the dispatcher; warning them that a runaway train was rolling towards them. He instructed them to stop their train, and get to a position of safety. The crew immediately initiated an emergency application of the train air brakes and got off the train. They then ran away from the train; getting as far away as they could prior to impact.

There were no injuries to the crew members. After reaching a point of safety the engineer contacted the dispatcher. During the conversation it was determined that the engineer should receive precautionary emergency medical care due to shortness of breath and an elevated anxiety.

ANALYSIS AND CONCLUSIONS:

Hand brakes were not applied on the locomotives or cars left unattended. The brake pipe angle cocks between the detached locomotive and remaining part of the train were in the closed position. The equalizing reservoirs on all four of the roll away locomotives were left isolated from the brake pipe as evidenced by all four of the Automatic Brake Cut Out Cocks observed in the closed position. This effectively “bottled the air” of the brake pipe. All of the multiple Independent Brake Set up Valves were left in the “trail” position on the locomotives of the runaway consist.

Event recorder data indicates that neither crew member of the striking train attempted to activate the emergency toggle on the head end device. This toggle would have sent a signal to the EOTD to induce an emergency application of the train brakes. It is probable that if that action had been taken while the End of Train Device was still in radio communication with the Head End Telemetry Device, that the accident may not have occurred.

Drugs and/or alcohol were not a factor in the accident. FRA post-accident toxicological testing was performed on the train crew members of the offending train H-MEMKCK1-02 and all test results were negative.

FATIGUE ANALYSIS:

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent 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 information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings.

FRA obtained fatigue related information from the locomotive engineer and conductor of the striking train H-MEMKCK1-02. This included a 10-day work history.

FRA concluded that fatigue was probable for both the locomotive engineer and conductor assigned to BNSF Freight Train H-MEMKCK1-02.

REGULATORY AND RULES COMPLIANCE:

The regulatory requirements for securing unattended equipment are found in 49 CFR 232.103 (n). These regulatory requirements are incorporated into the BNSF Operating Rules and Air Brake and Train Handling Rules. The crew of BNSF striking train H-MEMKCK1-02 failed to comply with those Operating and Air Brake and Train Handling Rules.

PROBABLE CAUSE AND CONCLUSION:

The accident was human factor caused. The crew of BNSF striking train H-MEMKCK1-02 failed to secure unattended equipment. Four separate requirements of 49 CFR Rule 232.103 (n) and carrier operating rules were not complied with.

1. The cars were not secured by hand brakes.

2. The locomotives were not secured by hand brakes.

3. The brake pipe was left closed to the atmosphere when not being charged by ground air or locomotive air supply.

4. The regulatory required established procedure for determining if adequate hand brakes have been applied was not performed.

Fatigue may have been a probable contributing factor in the accident.

The probable cause of the accident was failure to secure an unattended train.