Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-65

Burlington Northern Santa Fe
Clara City, MN
October 29, 2007

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2007-65

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: TC 1007125
2.Name of Railroad Operating Train #2: BNSF Rwy Co. [BNSF]	2a. Alphabetic Code: BNSF	2b. Railroad Accident/Incident No.: TC 1007125
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.: TC 1007125
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 10 | Day 29 | Year 2007	7. Time of Accident/Incident: 03:20: ☑ 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
5	4	1	400	TWIN CITIES

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
CLARA CITY	19.0	N/A	MN	CHIPPEWA

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
38 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	4	36.17	2

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	XDILHAS728

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?
3 MPH | E	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: 0

30. Trailing Tons *(gross tonnage, excluding power units)*: 2559

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

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	SHPX208027	66	no
(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
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	1	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	5	0	60	0	0
(2) Total Derailed	0	0	60	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$178,641.00	$170,000.00	H306	H403

Number of Crew Members: 41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	1

Length of Time on Duty: 45. Engineer/Operator	46. Conductor
Hrs 1 Mi 50	Hrs 1 Mi 50

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
1	1	HKCKNTW127

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?
35 MPH | E	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-2007-65

57. Trailing Tons *(gross tonnage, excluding power units)*: 3459

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): j | 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)*	FURX 8099	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
0	0

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	8	0	75	0	0
(2) Total Derailed	2	0	0	0	0	(2) Total Derailed	6	0	7	0	0

64. Equipment Damage This Consist: $274,511.00

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

66. Primary Cause Code: H306

67. Contributing Cause Code: H403

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 6 Mi 10

73. Conductor: Hrs 6 Mi 10

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: 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 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. 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: N/A

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 Ban	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
N/A	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	N/A	N/A

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)*
N/A

131. Total Number of Highway-Rail Crossing Users *(include driver)*
N/A

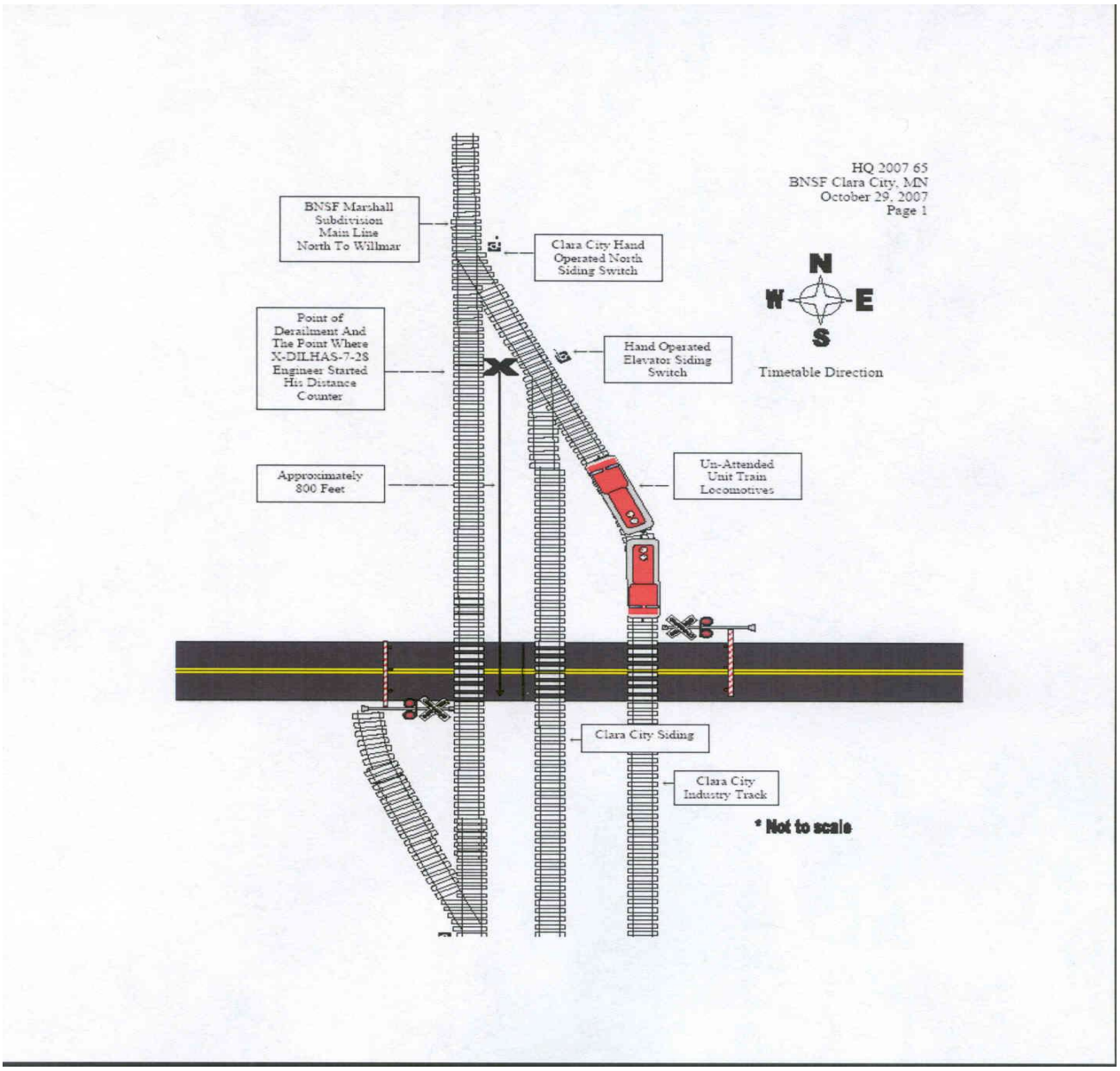
132. Locomotive Auxiliary Lights?	Code
1. Yes 2. No	N/A

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.



137. SYNOPSIS OF THE ACCIDENT

On October 29, 2007, at 3:20 a.m., CDT southbound Burlington Northern Santa Fe Railway (BNSF) empty ethanol train, X-DILHAS7-28 derailed while operating on the siding at Clara City, Minnesota. After clearing the Main Track, BNSF X-DILHAS7-28 made a back-up movement, shoving the rear car through the Main Track switch, which was lined for the Main Track. BNSF X-DILHAS7-28 then proceeded to operate into the siding track with the rear car derailed. The train operated about 3,000 feet after derailing the rear car, with additional cars derailed in front of the car, fouling the Main Track. A passing northbound BNSF freight train H -KCKNTW1-27, struck the fouling cars at milepost 19 on the BNSF Marshall Subdivision. The collision caused the two locomotives and 13 cars of BNSF H-KCKNTW1-27 to derail. The southward BNSF's 60 empty tank cars rolled over on their sides as a result of the impact. There were no injuries to the train crews reported at the time of the accident.

At the time of the accident it was dark, clear, and 39 °F with a slight wind from the southwest.

As a result of the collision the wall of a loaded tank car breached and the tank released about 89 tons of hydrochloric acid, a corrosive product. The release prompted an evacuation of approximately 400 residents from their homes for approximately 10 hours. No injuries were reported. The total estimated monetary damages were $623,152.

The accident was caused by the failure of the BNSF train crew of X-DILHAS7-28 to protect the rear of their train while making a shoving movement on the siding, resulting in the rear car passing through the improperly aligned Main Track switch and onto the Main Track without proper authority. Subsequently the forward movement caused the rear car to derail, along with four other cars, and foul the Main Track where they were struck by northward BNSF H-KCKNTW1-27.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

BNSF TRAIN X-DILHAS7-28

At 1:30 a.m., on October 29, 2007, a crew consisting a conductor, a brakeman, and engineer, reported for duty at Willmar, Minnesota to operate southbound BNSF Train X-DILHAS7-28 with locomotive EMD 9071 to Sioux City, Iowa, over the Marshall Subdivision. This terminal was the crew's away from home terminal and all received more than the required statuary off-duty rest period prior to reporting for duty. The train had five loaded cars added behind the locomotive and in front of a 60 car empty tank car train at Willmar. The train received a Class I air brake test before departing Willmar at 2:35 a.m., with five loads and 60 empties and 2,559 tons and was 3,887 feet long. The trip was uneventful before arriving at Clara City at 3:00 a.m.

At Clara City the train stopped to enter the siding through the hand operated north siding switch. At this time the crew held a job briefing to discuss how they would meet the approaching northbound train. The engineer instructed the brakeman to line the north siding switch to the reverse position, then inspect the train as they pulled in the siding. He instructed him to stop the rear of the train when it cleared the Main Track, then line and lock the north siding main track switch in the normal position. The engineer then instructed the brakeman to board the rear car and inform him when he was on. He told the brakeman to ride the side of the rear car into the siding where he would get off, the engineer would then reverse the movement and pick up the brakeman from his location on the ground. The brakeman told the engineer that at his former duty location in Montana they didn't make such a blind shove. He told the engineer he would walk up after he secured the main track switch in the normal position. The engineer insisted that the brakeman ride the cars up and then wait while he, the engineer, operated the train back to pick him up. The brakeman did as instructed.

The brakeman lined the north siding switch to the reverse position and the train operated into the siding, clearing the Main Track. After stopping the movement via the radio, the brakeman lined and locked the main track switch to the normal position. The conductor contacted the dispatcher and reported the train clear of the track warrant limits at 3:11 a.m. The train continued to operate south through the siding with the brakeman

riding on the rear car for 2,851 feet. The locomotive faced with the short hood forward, or south. The engineer was operating the train from the engineer's seat on the right side of the locomotive, while the conductor sat on the left rear seat.

The railroad timetable direction of the train was south. The geographic direction was southwest. Timetable direction will be used throughout this report. The siding and the Main Track are both flat and tangent with no visual obstructions in this area.

BNSF TRAIN H-KCKNTW1-27:

On October 28, 2007, at 9:10 p.m. a crew consisting of a conductor and engineer reported for duty at Sioux City to operate BNSF Train H-KCKNTW1-27 with locomotive FURX 8099 to Willmar over the Marshall Subdivision. This terminal is the home terminal for this crew and all crew members received more than the required statuary off duty rest period prior to reporting for duty.

The assigned mixed freight train consisted of two locomotives and 83 cars (8 loads/75 emptys). The train was 5,022 feet long and weighed 3,459 tons. The train received a Class I air brake test at Sioux City and departed Sioux City at 10:25 p.m. The northbound trip was uneventful and BNSF H-KCKNTW1-27 met two trains before arriving at Clara City at approximately 3:30 a.m. They made no stops to pick up or set out en route. They received additional Main Track authority from Clara City to Willmar in the form of track warrant number 4285 at 3:16 a.m. and continued to operate into Clara City on the single Main Track at the track speed of 49 mph. The locomotive faced with the short hood forward, toward the north. The engineer was operating the train from the engineer's seat on the right side of the locomotive, while the conductor was seated on the left rear seat.

The railroad timetable direction of the train is north. The geographic direction is northeast. The main track is flat and tangent with no visual obstructions in the area.

THE ACCIDENT:

BNSF TRAIN X-DILHAS7-28:

After stopping on the siding, the brakeman stepped off the locomotive on the engineer's side, and the engineer began a reverse movement on the brakeman's radio request. The engineer acted on this reverse request with no distance given by the brakeman. This reverse movement was made without point protection, a movement of about 3,374 feet. The brakeman did not give any distance on the radio as the engine approached his location and the engineer passed him, stopping the locomotive about five car lengths past his location. At this time the rear truck of the last car of the train operated through the north siding main track switch, which was lined for normal main track movement. At that time BNSF Train X-DILHAS7-28 occupied the Main Track at Clara City without proper authority. BNSF Train X-DILHAS7-28 then operated south on the siding derailing the rear car at the main track switch for the north siding. Four cars ahead of the rear car derailed as the train continued to operate at a speed less than 10 mph. The maximum authorized speed for all trains in all sidings is 10 mph, as designated in the current BNSF Twin Cities Division Timetable No. 3. After operating a distance of about 3,500 feet, the train began to suddenly pull harder and the train line air brake pressure began to drop. The engineer throttled down in an attempt to initiate a stop, and as the train speed approached 3 mph, the train went into an un-requested emergency. BNSF Train V-DILHAS7-28 had traveled 3,590 feet from the point of the stop where the brakeman boarded the locomotive. It was approximately 3:30 a.m.

BNSF TRAIN H-KCKNTW1-27:

At approximately 3:30 a.m., BNSF Train H-KCKNTW1-27, operating on the Main Track at about 49 mph, passed the X-DILHAS7-28 locomotive and observed the reflective material of a car out to foul the main track ahead of them. The engineer placed the train's air brakes in emergency and he and the conductor lay on the floor. H-KCKNTW1-27 struck one of the derailed car, SHPX 208029, of the X-DILHAS7-28 train, at about 35 mph. This was the fifth car from the rear of train. The impact from the collision rolled 60 empty tank cars on X-DILHAS7-28 on their left sides where they came to rest, east of the siding's roadbed. The two locomotives of H-KCKNTW1-27, FURX 8099 and CEFX 6001, the first five cars, and the nineteenth through thirty-third cars of the train derailed. All speeds are estimates due to the fact that the download data could not be read

on either locomotives. The maximum authorized speed for all trains is 49 mph, as designated in the current BNSF Twin Cities Division Timetable No. 3.

The derailment resulted in the wall of tank car UTLX 30002 being breached and releasing most of its contents, about 89 tons of hydrochloric acid. The shipping papers identified this product as: STCC Number 4930228, UN Identification Number 1789 Hazard Class 8, Packing Group II, a corrosive material. All but about 1,000 gallons of the product was released from the container to the environment. Clara City Fire Department responded to the derailment and as a precaution the Clara City Fire Chief ordered the evacuation of the southwest portion of Clara City, an area of about one half of a mile around the release site. About 400 people were displaced from their homes for about 10 hours and took shelter in a local church. The local schools were closed for the day, as were a number of local businesses. No injuries to the public were reported.

ANALYSIS AND CONCLUSIONS:

ANALYSIS - TOXICOLOGICAL TESTING:

Toxicological testing was conducted on the train crew members of X-DILHAS7-28 and H-KCKNTW1-27. The accident met the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing and a total of five train crew members were tested. The results for all tests were negative.

CONCLUSIONS:

Intoxication or impairment was not a causal factor.

ANALYSIS - LOCOMOTIVES AND CARS:

FRA's inspection of BNSF locomotive EMD 9071 of X-DILHAS7-28 following the incident revealed no defects. The locomotive received a periodic inspection in Glendive, Montana, on October 8, 2007. FRA's inspection of the five cars that remained on the track from the train revealed no defects.

FRA's inspection of BNSF locomotive FURX 8099 of H-KCKNTW1-27 following the incident revealed no defects. The locomotive received a periodic inspection in Kansas City, Kansas, on September 29, 2007. An inspection of BNSF locomotive CEFX 6001 was not possible due to the position of the locomotive following the derailment. This locomotive received a periodic inspection on October 13, 2007, at Northtown, Minnesota. FRA's inspection of the 17 cars of H-KCKNTW1-27 not derailed in the accident revealed no defects. An inspection of the 56 cars of H-KCKNTW1-27 remaining on the siding at Granite Falls, Minnesota, revealed seven defects, none of which caused or added to the severity of the derailment at Clara City.

CONCLUSIONS:

Defects found on the locomotives and cars of both trains did not contribute to the cause or severity of the derailment.

ANALYSIS - LOCOMOTIVE ENGINEER/CONDUCTOT/BRAKEMAN:

The locomotive engineer on X-DILHAS7-28 set the distance counter on the controlling locomotive at the clearance point of the main track upon entering the siding. He failed to account for an 800-foot difference in distance to the main street crossing on the south end of the siding. When he made the shoving movement back to the brakeman's position, he was aware the rear of the movement was not protected. The engineer had no record of disciplinary actions during his period of service with the railroad. During 2006 and 2007 he had 72 observed efficiency tests conducted by railroad managers for rules compliance. Eight of the tests, or about 11 percent, were failures.

The conductor on X-DILHAS7-28 was positioned on the controlling locomotive when the train entered the siding. He had participated in a job briefing about the movements to be made prior to the train entering the siding and was comfortable that the brakeman could deal with the move without assistance. He was on board the controlling locomotive when the shove movement to pick up the brakeman occurred and was aware that the rear of the movement was not protected. He was not in a position to observe the distance counter, set by

the locomotive engineer, on the controlling locomotive. The conductor had no record of disciplinary actions during his period of service with the railroad. During 2006 and 2007 he had 42 observed efficiency tests conducted by railroad managers for rules compliance. Two of the tests, or less than 5 percent, were failures.

The brakeman on X-DILHAS7-28 aligned the main track switch to allow the train to enter the siding at Clara City. He had participated in a job briefing about the movements prior to aligning the main track switch. He returned the switch to the normal position after the train reached the clearance point of the main track on the siding and boarded the rear car to ride on it while the train pulled further into the siding. He got off the car and directed the locomotive engineer to shove back and pick him up and began walking toward the head end of the train. He was aware that there was no one at the rear of the train to provide protection while the shoving movement was made. He boarded the locomotive when the locomotive engineer stopped the train and he walked back about seven car lengths because the locomotive engineer shoved beyond his position. The brakeman had no record of disciplinary actions during his period of service with the railroad. The managers of the railroad conducted 29 observed efficiency tests during 2006 and 2007. One of the tests was a failure, or about 4 percent.

As a result of a formal investigative hearing held by the BNSF, the entire crew of X-DILHAS7-28 was dismissed from service.

CONCLUSIONS:

The crew members of X-DILHAS7-28 held a job briefing before entering the siding at Clara City to clear the main track, discussing the movements they were to make, and who would control those moves. Each of the crew members knew that the shove movement to pick up the brakeman, after he restored the main track switch to the normal position, would be unprotected during the shoving movement. The conductor and the brakeman had no knowledge of the use of the distance counter during the shoving movement by the locomotive engineer. The locomotive engineer operated the train into the siding and used the distance counter to determine the distance he could shove when picking up the brakeman. On the unprotected shove movement the locomotive engineer failed to stop the movement at the brakeman's location, operating the train past him about seven car lengths. None of the crew members questioned if the extra distance shoved would cause a problem.

ANALYSIS - LOCOMOTIVE EVENT RECORDER DATA:

FRA analyzed the download data from the locomotive of X-DILHAS7-28. After stopping at the Clara City north siding switch, the train operated in the forward direction, or south, into the siding for 4,061 feet and stopped to allow the brakeman to line and lock the main track switch for the normal position. The train then operated south for 2,851 feet before stopping to allow the brakeman to detrain. The train then reversed direction and was operated 3,374 feet, a distance that was 523 feet greater in the reverse direction than in the forward direction. This movement shoved the rear car through the main track switch, which was lined and locked for the main track, out of the siding and onto the main track. When DILHAS again pulled forward the rear car derailed near the frog of the switch and was dragged for 3,649 feet.

CONCLUSIONS:

Event recorder data revealed the distance traveled during the shoving movement to pick up the brakeman exceeded the distance on the counter device set by the locomotive engineer. Had the engineer not shoved past the brakeman an additional five car lengths the rear car would not have passed through the north siding main track switch. The extra distance traveled by the train during the movement caused the rear car to pass through the switch points of the main track switch while lined for the main track. The subsequent move forward pulled the car back into the switch points of the main track switch, causing the car to derail and foul the main track. The crew failed to be aware of the additional distance traveled during the shoving movement.

ANALYSIS - EMERGENCY RESPONSE:

FRA inspectors found that the local emergency responders were not notified of the derailment and resulting collision, with the possibility of hazardous material involvement, by the BNSF or any member of the public until 3:51 a.m. This was more than 20 minutes after the railroad received the report of the derailment. This delayed police emergency responders arrival on site until 4:04 a.m. The first arriving police officer reported

back to his dispatcher center that he had located a hazardous material release cloud of vapor. Fire department responders were notified by their dispatcher at 4:14 a.m. and arrived on site at 4:20 a.m., to begin assessing the situation and the exposure to the public.

CONCLUSIONS:

Emergency responders were not notified of the derailment and collision for a considerable time after the railroad became aware of the accident. This delayed the emergency response and could have been a significant factor in the protection of the public if hazardous materials of a more extreme nature were involved.

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, which may have contributed to the cause of the accident.

FRA found that fatigue was probable for the crew of BNSF Train X-DILHAS7-28.

OVERALL CONCLUSIONS:

The railroad was not in compliance with Federal Regulations and the Carriers own Standards. The accident occurred because of the failure to properly protect a shoving movement due to the absence of a crew member at the leading car of the trailing end. The unprotected shove movement caused the train to enter the Main Track without authority through an improperly lined switch, subsequently resulting in the derailment of the rear car after a forward movement. The engineer used the locomotive distance counter to judge where the rear of the train was while making the shoving movement on the siding. He admitted he failed to correctly calculate the distance traveled while using the distance counter on the locomotive.

FRA Hazardous Material inspections revealed that the consist report for BNSF Train X-DILHAS7-28 showed transporting 60 cars as: Residue, last contained alcohols, N.O.S., UN Identification Number 1987, Hazardous Class 3, Packing Group II, STCC# 4909152. None of the 60 cars were actually placarded as a hazardous material shipment. The entire train was a new train and none of the cars had previously contained a hazardous material. All of the cars were built, cleaned and purged in 2007. FRA assessed 60 defects against the carrier for failure to comply with 49 CFR Part 174.24, Shipping Papers.

FRA Operating Practice inspections revealed several exceptions in the actions of the crew of BNSF Train X-DILHAS7-28.

1. The crew failed to properly protect the shove movement on the Clara City siding as required by General Code of Operating Rules (GCOR) 6.5 “Handling Cars Ahead of Engine,” as amended by BNSF.

2. The crew failed to adhere to the requirements of GCOR Rule 5.3.7, Radio Response: “When radio communication is used to make movements, crew members must respond to specific instructions given for each movement.

3. The crew failed to adhere to the requirements of 49 CFR §220.49: “Radio communication used in shoving, backing or pushing movements".

4. The crew used a mixture of radio and hand signs in contradiction of GCOR rule 5.3.6, Radio and Voice Communication.

5. The crew occupied the Main Track without authority as required by GCOR Rule 6.3, Main Track Authority.

6. Both crews failed to properly announce the emergency situation over the radio as required by 49 CFR §220.47 Emergency radio transmissions.

7. BNSF Train H-KCKNTW1-27 leading locomotive, FURX 8099, operated without a functioning speed recorder on the Main Track at speeds greater than 30 MPH as required by 49 CFR §229.135, Event recorders.

PROBABLE CAUSE & CONTRIBUTING FACTORS:

The accident was caused by the failure of the train crew on BNSF Train X-DILHAS7-28 to protect the rear of their train while making a shoving movement on the siding, resulting in the rear car passing through the improperly aligned Main Track switch and onto the Main Track without proper authority. Subsequently the forward movement caused the rear car to derail, along with four other cars, and foul the Main Track where they were struck by BNSF Train X-KCKNTW1-27.

#