Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-34

Norfolk Southern (NS)
Loudon, Tennessee
May 22, 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-2006-34

1.Name of Railroad Operating Train #1 Norfolk Southern Corp. [NS]	1a. Alphabetic Code NS	1b. Railroad Accident/Incident No. D025253
2.Name of Railroad Operating Train #2 Norfolk Southern Corp. [NS]	2a. Alphabetic Code NS	2b. Railroad Accident/Incident D025253
3.Name of Railroad Responsible for Track Maintenance: Norfolk Southern Corp. [NS]	3a. Alphabetic Code NS	3b. Railroad Accident/Incident No. D025253
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident Month 05 / Day 22 / Year 2006	6. Time of Accident/Incident 02:07: ☐ 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) — **02**

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

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Loudon	160	N/A	TN	LOUDON

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
66 F		2		2		2

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
Blair Bend Lead		1	0		1

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
	7	1. Yes	1	T72T52 2

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?
	11	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) Code(s): g, j, l, m, N/A	0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter: 0

29. Trailing Tons (gross tonnage, excluding power units): 3050

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	no
(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/A

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	1	0	0	0	0
(2) Total Derailed	1	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	20	0	0	0	0
(2) Total Derailed	2	0	15	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
120200	875	H607	H404

Number of Crew Members				Length of Time on Duty	
40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen	44. Engineer/Operator	45. Conductor
N/A	0	1	1	Hrs 6 Mi 7	Hrs 6 Mi 7

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: 2

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

51. Caboose Occupied by Crew? 1. Yes 2. No: N/A

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
	1	1. Yes	1	44ET52 0

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?
	5	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

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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
9021			g | j | l | m | N/A	0

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)	NS9203	1	no		N/A	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A	60. Was this consist transporting passengers? (Y/N)	N/A	

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	4	0	0	0	0	(1) Total in Equipment Consist	70	0	0	0	0
(2) Total Derailed	1	0	0	0	0	(2) Total Derailed	0	0	0	0	0

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
80000	875	H607	H399

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen	71. Engineer/Operator	72. Conductor
1	0	1	0	Hrs 3 Mi 17	Hrs 3 Mi 17

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 | 1

77. Was EOT Device Properly Armed? 1. Yes 2. No | 1

78. Caboose Occupied by Crew? 1. Yes 2. No | N/A

Highway User Involved

79. Type — 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)

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

81. Direction geographical) — Code: N/A
1.North 2.South 3.East 4.West

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

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

83. 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)

84. Position of Car Unit in Train: N/A

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

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

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	N/A

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

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

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

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

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

93. Driver's Age: N/A

94. Driver's Gender — Code: N/A
1. Male 2. Female

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

96. Driver — Code: N/A
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)

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

98. View of Track Obscured by (primary obstruction) — Code: N/A
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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	N/A	N/A

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

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

102. Highway Vehicle Property Damage (est. dollar damage): N/A

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

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

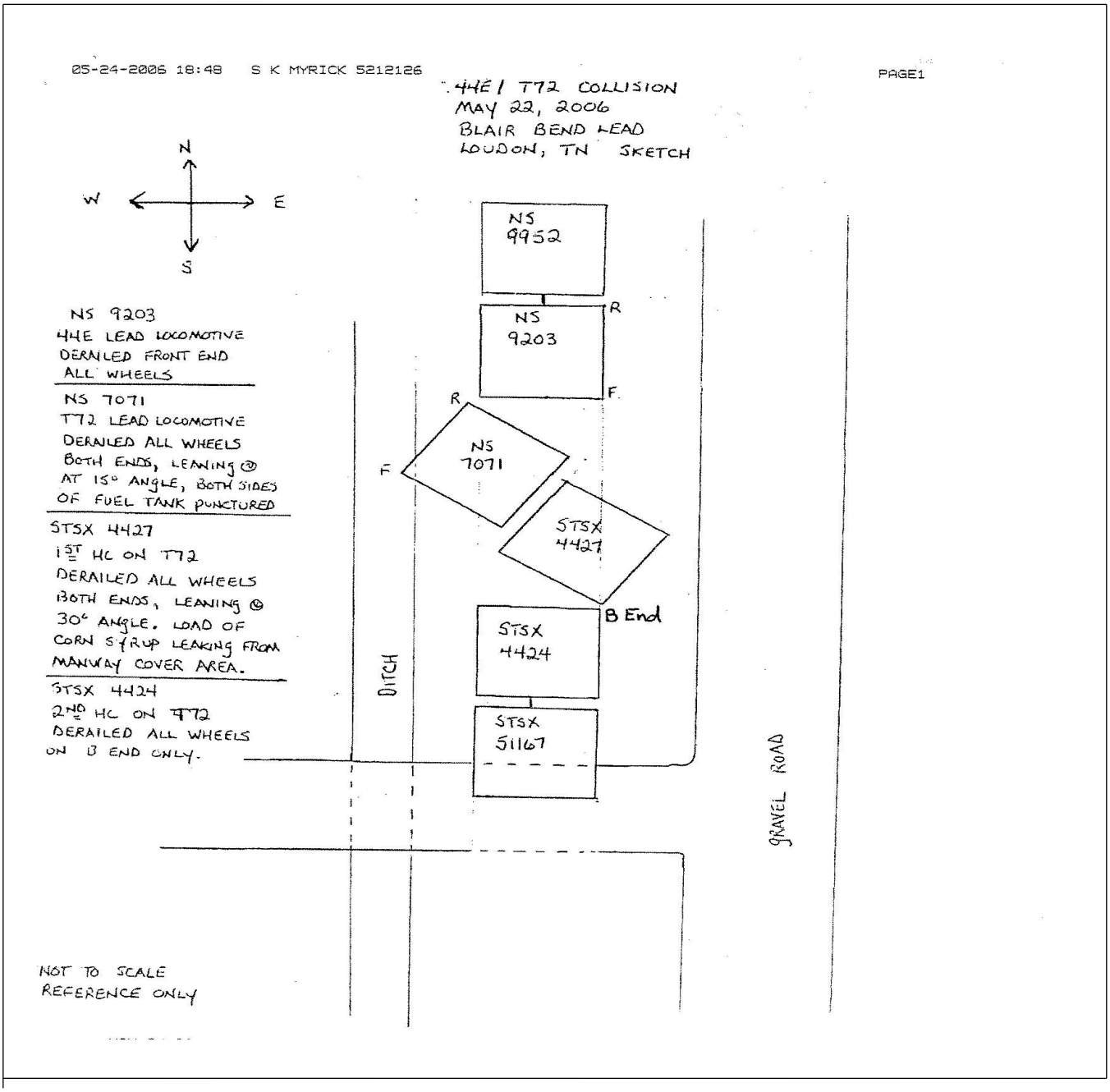
105. Locomotive Auxiliary Lights Operational? — Code: N/A
1. Yes 2. No

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

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

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

HQ-34-
2006
sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

On May 22, 2006, about 2:07 p.m. Eastern Standard Time (EST) NS Train 44ET520 was operating westbound from Knoxville to Loudon, Tennessee (TN) with four locomotives and 70 loaded grain cars, 9,109 tons. It collided head-on with NS Train T72T522, operating with one locomotive and 35 railcars, 3,050 tons, on the Blair Bend Lead near Loudon.

The accident resulted in the derailment of the locomotive of Train T72T522 along with the railcar next to the locomotive and the lead wheels of the second car from the locomotive. The head-end of the lead locomotive on Train 44ET520 was also derailed.

Current damage estimates are $200,200 for equipment and $1,750 for track. It was a cloudy day with a temperature of 66 ̊F. The only hazardous material released was approximately 250 gallons of diesel fuel from one of the locomotives. No injuries are reported.

The probable cause of the accident was the failure of both trains to comply with the provisions of restricted speed.

A contributing cause of the accident was the failure of the crew members of Train 44ET520 to comply with the dispatcher's bulletin and special timetable instructions.

110. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

Train 44ET520

The crew of Train 44ET520 was called to go on duty at Knoxville, TN on May 22, 2006, at 10:50 a.m. The crew consisted of a conductor and engineer. Prior to reporting for duty, the conductor had received a rest period of 16 hours and 50 minutes and the engineer had a rest period of 12 hours and 50 minutes. The train consisted of four locomotives and 70 loads of grain for a total of 9,109 tons. The crew was to operate the train on the Knoxville District West End Subdivision to the Blair Bend Lead and deliver the grain to the A.E. Staley Corporation.

The crew performed the normal initial terminal duties, departed Knoxville Yard, mile post (MP) 123.0A, via a crew bus and proceeded to Train 44ET520 located at MP 130.0A. The crew members performed the required inspections and other duties prior to moving the train. They received a track warrant authority to proceed westbound onto the Knoxville District West End Subdivision toward the Blair Bend Lead. The first track warrant authorized movement of the train to MP 149.0A. A second track warrant was issued authorizing movement to the Blair Bend Lead switch. At Blair Bend Lead, the signal was displaying a proceed indication and the crew members proceeded west toward the Blair Bend Lead.

Dispatcher's Bulletin and Timetable Special Instructions require that trains entering the Blair Bend Lead must contact the Loudon Yard Road Switcher prior to occupying the lead. If contact with the switcher cannot be established, the dispatcher must be contacted for instructions. The crew stopped at the Blair Bend Lead switch, aligned the switch for their movement, and operated their train onto the lead without complying with these special instructions. The engineer was alone in the operating compartment of the locomotive as the conductor had remained at the main line switch to return it to normal position after the train had cleared the main track.

Train T72T522

On May 22, the crew of Train T72T522 reported for duty at the Loudon Yard Office at 8 a.m. The crew consisted of three employees; an engineer, conductor and brakeman. They are responsible for performing switching duties at the industries located in the Loudon Yard. All crew members had received a rest period of 40:55 minutes prior to reporting for duty.

They had performed normal switching duties during the morning and returned to the yard office for lunch around 11:30 am. After lunch they called Staley manufacturing to determine what was needed in the way of switching. They then notified the Staley plant industrial switcher and Staley security they were entering the plant facility to perform switching.

After switching the Staley plant, they departed with 30 loads and 4 empties, 3,050 tons, for delivery to the Loudon Yard. The crew stopped at the west end yard office to discuss the situation and perform a job briefing. During their job briefing, the crew was concerned that their locomotive power would not be enough to clear the east end switches and make the steep grade located at the east end of the yard. They decided that the conductor and brakeman would use their personal vehicle (POV) and proceed to the east end of the yard and align the switches for a straight move up the lead. The train crew was not aware of any other movement entering their territory. The engineer was alone in the operating compartment as he traversed the main lead through the yard. He was attempting to gain enough momentum to ascend the severe incline on the lead. He looked at the speed indicator when he passed the east end lead switches and said he was operating between 12 and 14 miles per hour (mph).

NS timetable and geographic direction is north and south. Timetable direction is used throughout this report.

THE ACCIDENT

Train 44ET520

The engineer of Train 44ET520 was operating from a wide-body locomotive, which gave him a panoramic view of the territory ahead of his movement as he entered a 9.35-degree left hand curve. According to the event recorder, the engineer was proceeding at a speed of five mph, with a 20 lbs automatic brake application, in throttle notch no. 8, with amperage on the lead locomotive of 680 amps. He intended to stop the train after it cleared the main track and allow the conductor to walk back to the locomotive.

Train T72T522

The engineer of Road Switcher T72T522 was operating from the right side of the locomotive giving him a complete view of the track in the front of his movement as he entered a 9.35-degree right-hand curve. He was not expecting any other movements in this section of the yard. The engineer said he initiated a whistle signal for a highway-rail grade crossing and turned back to see if his train would clear the east end switches. As he looked back toward the track he was operating over, he saw Train 44ET520 directly in front of him. The engineer said he zeroed the throttle, applied a full service independent brake, initiated an emergency brake application, and abandoned the locomotive. He was off the locomotive about two or three seconds prior to impact.

ANALYSIS AND CONCLUSION
Analysis

Dispatcher's Bulletin and Timetable Special Instructions require that trains entering the Blair Bend Lead must contact the Loudon Yard Road Switcher prior to occupying the lead. If contact with the switcher cannot be established, the dispatcher must be contacted for instructions. The crew stopped at the Blair Bend Lead switch, aligned the switch for their movement, and operated their train onto the lead without complying with these special instructions. The engineer was alone in the operating compartment of the locomotive as the conductor had remained at the main line switch to return it to normal position after the train had cleared the main track.

After switching the Staley plant, they departed with 30 loads and 4 empties, 3,050 tons, for delivery to the Loudon Yard. The crew stopped at the west end yard office to discuss the situation and perform a job briefing. During their job briefing, the crew was concerned that their locomotive power would not be enough to clear the east end switches and make the steep grade located at the east end of the yard. They decided that the conductor and brakeman would use their POV and proceed to the east end of the yard and align the switches for a straight move up the lead. The train crew was not aware of any other movement entering their territory. The engineer was alone in the operating compartment as he traversed the main lead through the yard. He was attempting to gain enough momentum to ascend the severe incline on the lead.

The engineer of Train 44ET520 was operating from a wide-body locomotive, which gave him a panoramic view of the territory ahead of his movement as he entered a 9.35 degree left hand curve. According to the event recorder, the engineer was proceeding at a speed of 5 mph, with a 20 lbs automatic brake application, in throttle notch no. 8, with amperage on the lead locomotive of 680 amps.

The engineer of Road Switcher T72T522 was operating from the right side of the locomotive giving him a complete view of the track in the front of his movement as he entered a 9.35-degree right-hand curve. He was not expecting any other movements in this section of the yard. The engineer said he initiated a whistle signal for a highway-rail grade crossing and turned back to see if his train would clear the east end switches. As he looked back toward the track he was operating over, he saw Train 44ET520 directly in front of him. The engineer said he zeroed the throttle, applied a full service independent brake, initiated an emergency brake application, and abandoned the locomotive.

There were no injuries reported. The only hazardous material spilled is about 250 gallons of diesel fuel from Locomotive NS 7071.

FRA Post-Accident Drug and Alcohol Testing was conducted with negative results.

At the time of the collision, the temperature was 66 ̊F with cloudy visibility.

PROBABLE CAUSE AND CONTRIBUTING FACTORS

The probable cause of the accident was the failure of both trains to comply with the provisions of restricted speed.

A contributing cause of the accident was the failure of the crew members of Train 44ET520 to comply with the dispatcher's bulletin and special timetable instructions.

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