
# *Federal Railroad Administration*
# *Office of Safety*
# *Headquarters Assigned*
# *Accident Investigation Report*
# *HQ-2005-92*

## *Norfolk Southern (NS)*
## *Millbury, Ohio*
## *October 21, 2005*

***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-2005-92

| | | |
|---|---|---|
| 1.Name of Railroad Operating Train #1: Norfolk Southern Corp. [NS ] | 1a. Alphabetic Code: NS | 1b. Railroad Accident/Incident No.: 022717 |
| 2.Name of Railroad Operating Train #2: Norfolk Southern Corp. [NS ] | 2a. Alphabetic Code: NS | 2b. Railroad Accident/Incident: 022717 |
| 3.Name of Railroad Responsible for Track Maintenance: Norfolk Southern Corp. [NS ] | 3a. Alphabetic Code: NS | 3b. Railroad Accident/Incident No.: 022717 |
| 4. U.S. DOT_AAR Grade Crossing Identification Number | 5. Date of Accident/Incident: Month 10 / Day 21 / Year 2005 | 6. Time of Accident/Incident: 02:30:00 ☐ 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 |
|---|---|---|---|---|
| 17 | 0 | 0 | 0 | Dearborn |

| 13. Nearest City/Town | 14. Milepost *(to nearest tenth)* | 15. State Abbr | 15. State Code | 16. County |
|---|---|---|---|---|
| Millbury | 280.7 | N/A | OH | WOOD |

| 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 |
|---|---|---|---|
| 50 F | 2 | 2 | 1 |

| 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 |
|---|---|---|---|
| Main Two | 4 | 57 | 3 |

## 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 | 20EB121 |

| 28. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code | 29. Trailing Tons *(gross tonnage, excluding power units)* | 30. Method(s) of Operation *(enter code(s) that apply)* | 30a. Remotely Controlled Locomotive? |
|---|---|---|---|
| 0 MPH — R | 4497 | a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)* — Code(s): e, N/A, N/A, N/A, N/A | 0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter — 0 |

| 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)* | N/A | N/A | 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 | 0 |
| (2) Total Derailed | 1 | 0 | 0 | 0 | 0 |

| 35. Cars | Loaded a. Freight | Loaded b. Pass. | Empty c. Freight | Empty d. Pass. | e. Caboose |
|---|---|---|---|---|---|
| (1) Total in Equipment Consist | 35 | 0 | 5 | 0 | 0 |
| (2) Total Derailed | 3 | 0 | 0 | 0 | 0 |

| 36. Equipment Damage This Consist | 37. Track, Signal, Way, & Structure Damage | 38. Primary Cause Code | 39. Contributing Cause Code |
|---|---|---|---|
| 192464 | 6000 | H401 | N/A |

Number of Crew Members

| 40. Engineer/ Operators | 41. Firemen | 42. Conductors | 43. Brakemen |
|---|---|---|---|
| 1 | N/A | 1 | N/A |

Length of Time on Duty

| 44. Engineer/Operator | 45. Conductor |
|---|---|
| Hrs 1 Mi 30 | Hrs 1 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 | 50. Was EOT Device Properly Armed? 1. Yes 2. No |
|---|---|
| 1 | 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 |
|---|---|---|
| 1 | 1 | 217C320 |

| 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? |
|---|---|---|
| 19 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

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| 56. Trailing Tons *(gross tonnage, excluding power units)* | c. Auto train stop<br>d. Cab<br>e. Traffic<br>f. Interlocking | i. Time table/train orders<br>j.Track warrant control<br>k. Direct traffic control<br>l.Yard limits | o. Positive train control<br>p. Other *(Specify in narrative)*<br>Code(s) | 2 = Remote control tower<br>3 = Remote control transmitter - more than one remote control transmitter |
|---|---|---|---|---|
| 6644 | | | e N/A N/A N/A N/A | 0 |

| 58. Principal Car/Unit | a. Initial and Number | b. Position in Train | c. Loaded *(yes/no)* |
|---|---|---|---|
| (1) First involved *(derailed, struck, etc)* | NS 9868 | 1 | no |
| (2) Causing *(if mechanical cause reported)* | 0 | N/A | N/A |

59. 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 |

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 |
|---|---|---|---|---|---|
| (1) Total in Train | 2 | 0 | 0 | 0 | 0 |
| (2) Total Derailed | 1 | 0 | 0 | 0 | 0 |

| 62. Cars | Loaded a. Freight | Loaded b. Pass. | Empty c. Freight | Empty d. Pass. | e. Caboose |
|---|---|---|---|---|---|
| (1) Total in Equipment Consist | 54 | 0 | 2 | 0 | 0 |
| (2) Total Derailed | 2 | 0 | 0 | 0 | 0 |

| 63. Equipment Damage This Consist | 64. Track, Signal, Way, & Structure Damage | 65. Primary Cause Code | 66. Contributing Cause Code |
|---|---|---|---|
| 185871 | 0 | H401 | N/A |

Number of Crew Members

| 67. Engineer/ Operators | 68. Firemen | 69. Conductors | 70. Brakemen |
|---|---|---|---|
| 1 | N/A | 1 | N/A |

Length of Time on Duty

| 71. Engineer/Operator | 72. Conductor |
|---|---|
| Hrs 7 Mi 45 | Hrs 7 Mi 45 |

| Casualties to: | 73. Railroad Employees | 74. Train Passengers | 75. Other |
|---|---|---|---|
| Fatal | 0 | 0 | 0 |
| Nonfatal | 1 | 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 — 2

## Highway User Involved

79. Type — Code: N/A
C. Truck-Trailer. F. Bus J. Other Motor Vehicle
A. Auto D. Pick-Up Truck G. School Bus K. Pedestrian
B. Truck E. Van H. Motorcycle 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)* 3.Train *(standing)* 4.Car(s) *(moving)* 5.Car(s) *(standing)* 6.Light Loco(s) *(moving)* 7.Light(s) *(standing)* 2.Train *(units pushing)* 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: 4
1. Highway User 2. Rail Equipment 3. Both 4. Neither

86c. State here the name and quantity of the hazardous materials released, if any.
None Released

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) | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

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

89. Whistle Ban — Code: 2
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: 0

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 |
|---|---|---|
| | 0 | 0 |

99. Driver Was — Code: 3
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)* 0

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

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

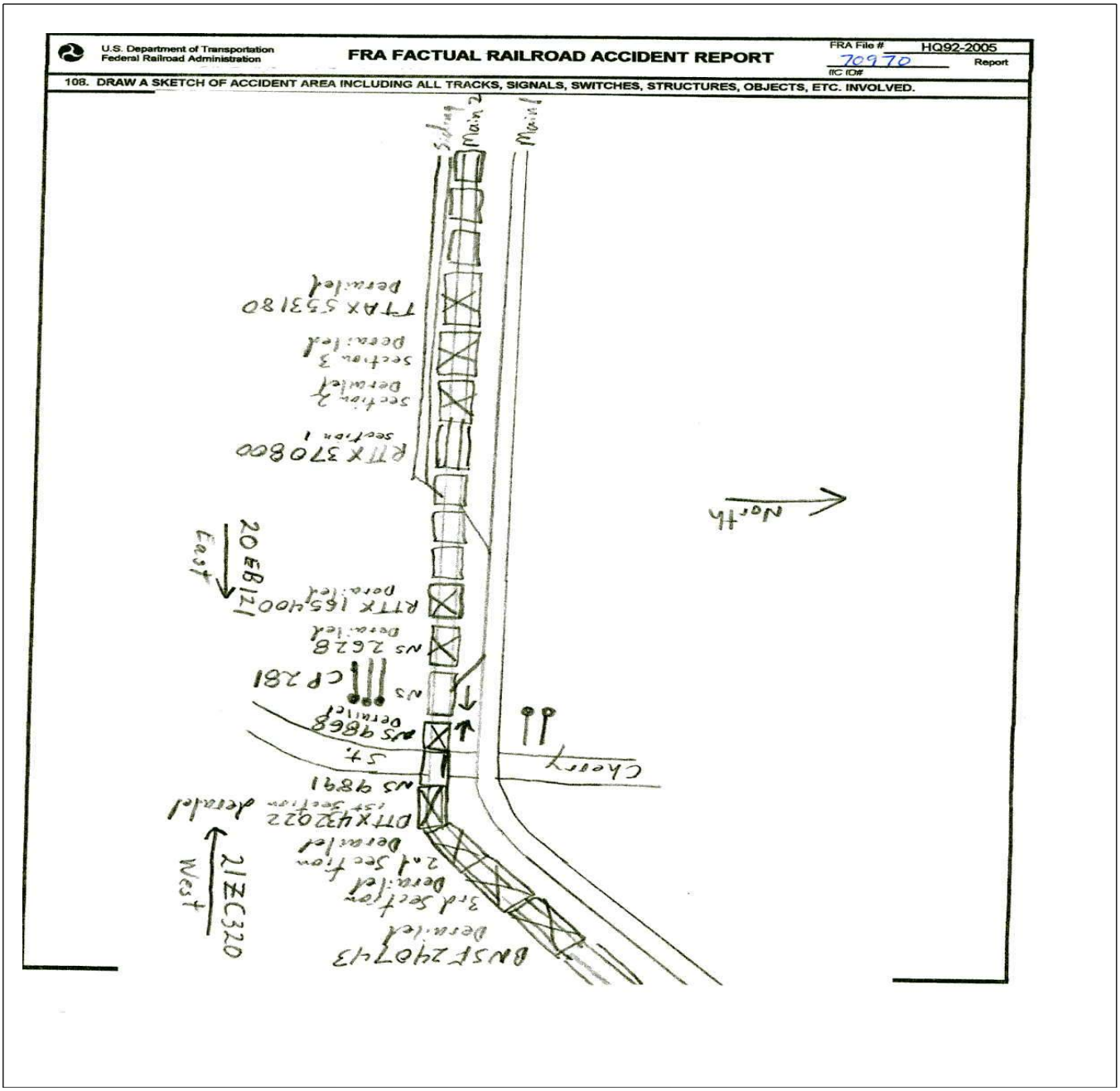
105. Locomotive Auxiliary Lights Operational? — Code: N/A
1. Yes 2. No

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-2005-92.jpg



109. SYNOPSIS OF THE ACCIDENT

At about 2:25 PM on Oct 21, 2005 NS eastbound train 20 EB121 was hit head on by westbound train 21ZC320 at milepost CD281 on the Toledo East district of the Dearborn Division The crew on train 20 EB121 was composed of engineer P.M. Chestnut and Conductor G.L Hartswick. This crew went on duty at 1 PM at Toledo and departed the Toledo station at 2:10 PM. The train consisted of two locomotive NS 9716 (Lead) and 2826, and 41 cars (35 loads, 6 empties), 4829 tons and 7121 feet. The engineer stated he did not have any problems with the train open his departure. The crew proceeded east on main track #2. The crew stated they observed all clear signals until they approached the control point signal at milepost 281. The crew stated this signal was displaying a stop signal indication. The engineer stated he was traveling at about 40 MPH when he saw the signal was a stop signal and after confirming this with his conductor he placed the train in emergency. The train continued east going past the signal at CD281 and into a double cross over switch interlocking. The western most switch was lined for movement on main 2 and the eastern most switch was lined for a west bound move from main 2 to main 1. This switch was run through on a trailing point move by train 20EB121. The train then came to a stop with the lead locomotive on main 2 but still in the interlocking. The crew heard the west bound train 21ZC320 calling signals just east of their location. The crew on 20 EB121 called to the 21ZC320 over the radio and told the crew that they were by the signal at CD 281 and were fouling the interlocking on main 2 and for them, the crew on 21Z, to bring their train to a stop. The crew on train 20 EB121 stated they then dismounted their train and ran from the tracks in a southerly direction.

1. The method of train operation was as follows:

Eastbound train 20EB-121 passed the stop signal on Main 2 at CP-281. Their train continued on Main 2, thru the interlocking, through a trailing point switch and stopped approximately 15 car lengths past the signal.

Westward train 21Z-320 also located on Main 2, was informed via radio, by train 20EB-121, to stop immediately as they had gone by the signal. Train 21Z-320 immediately placed their train in emergency. Within a very short undetermined amount of time, hit train 20EB-121 head-on at a recorded 19 MPH.

The NS Train Dispatcher had intended for Eastward train 20EB-121 to stop on Main 2 west of CP-281. Westward train 21Z320 also on Maine 2, was lined to crossover from Main 2 to Main 1.

Crew members interviews on Eastward train 20EB-121stated that the approach signal to CP-281 was clear. They traveled approximately 1 1/2 miles until noticing the home signal at CP-281 was all red. They immediately placed their train into emergency.

Crew members interviews on Westward train 21Z-320 stated that they were proceeding at approximately 38 to 40 MPH, when they received a radio transmission from 20EB-121 to stop their train.

2. Both trains were intermodal trains. The 21Z had double stack cars through out the train and the 20 E were single containers/trailers.

The crew on train 21ZC320 was called for duty out of Conway, PA at 6:45 AM and departed Conway at 8:00 AM. The crew was heading west on main track # 2 and had just past the signal at milepost CD 279 (approach limited) when they heard the track side analyzer at milepost CD 283 announce the passing of a train on main 2 traveling east. The crew, Engineer J.D. East and Conductor G. B. Vanmeter then heard the crew on train 20 EB121 on the radio telling them that they (20E) were fouling the interlocking at CD 281 and to bring their train to a stop. Engineer West stated he applied air and his conductor placed the train in emergency from the conductors emergency brake lever. Mr. West stated his conductor left out the front door of the cab and dismounted the train at a speed between 20-30 MPH from the south side of the train. Mr. West stated he placed the train dynamic brakes in number 8 notch and then braced himself against the control stand. Mr. West stated he estimated the train speed at impact to be between 15-20 MPH. Train 21ZC320 consisted of two locomotives NS9868 (Lead) and 9891, with 57 cars ((54 loads and 3 empties), 6,644 tons and 9,999 feet. Mr. West stated his train was handling alright and had no problems stopping at a previous stop.

Mr. Vanmeter suffered cuts to his face requiring stitches and contusion/abrasions to hands/feet/knees. He was transported to a local hospital (St. Charles Mercy Hospital) where he received medical attention and remained over night.

All crew members were tested under Subpart C.

An inspection of the signal system by FRA and Norfolk Southern disclosed the system operated as intended. Post accident signal testing and sight distance testing confirmed the previous assessment. The testing confirmed that whenever the signal at milepost CD 281 eastbound displayed a stop indication the advance eastbound signal at milepost CD 282 displayed a signal no greater than an approach indication.

The collision of the two trains resulted in the following derailed cars and engines:

20 EB121, trailing engine 2628 rear trucks derailed,
lead car RTTX 165400 all wheels A end,
5th car RTTX 370800 (articulating car) 2 and 3 section derailed all wheels (2 sections of a 3 section car)
6th car TTAX 553180 all wheels A end
21ZC320 leading engine 9868 3 axle derailed,
lead car DTTX 432022 (3 section articulating car ) all wheels all three sections derailed
2nd car BNSF 240743 all wheels on A end
The accident was caused by the failure of the crew on train 20EB121 to properly identify the approach signal indication at milepost CD 283 and then failing to stop their train at the stop signal at milepost CD 281.

Note: Rail view cameras on lead unit of train 20E revealed signal at CD 282 was and approach and signal at CD 281 was a stop. Both crew members on train 20 E stated they saw all signals and all were clear until the stop signal at CD 282. Dispatchers tape show crew called the signal at CD 282 as a clear.

110. NARRATIVE

The following was obtained from an investigation that was performed by the Federal Railroad Administration.
Circumstances Prior to the Accident:

The crew on train 20EB121 was composed of engineer P.M. Chestnut and Conductor G.L Hartswick. This crew went on duty at 1 PM at Toledo and departed the Toledo station at 2:10 PM. Prior to going on duty the crew had their proper rest. The train consisted of two locomotive NS 9716 (Lead) and 2826, and 40 cars (35 loads, 5 empties), 4497 tons and 7121 feet. The engineer stated he did not have any problems with the train upon his departure. The crew proceeded east on Main Track #2. The crew stated they observed all clear signals until they approached the control point signal, CP281 located at milepost CD 281. This signal displayed a stop indication..

The crew on train 21ZC320 was called for duty out of Conway, PA at 6:45 AM and departed Conway at 8:00 AM. The train's crew was composed of J.D. West, Engineer and G.B. Vanmeter. This crew had proper rest prior to going on duty. Train 21ZC320 consisted of two locomotives NS9868 (Lead) and 9891, with 56 cars ((54 loads and 2 empties), 6,644 tons and 9,999 feet. Mr. West stated his train was handling alright and had no problems stopping at a previous stop. Train 21ZC320 was traveling west Main Track 1 and crossed over to Main Track 2 at milepost CD 268.3 due to track work being conducted at milepost CD 272. Train 21ZC320 was traveling on Main Track 2 at the time of the incident.
The Accident:
At about 2:30 PM On October 21, 2005 NS eastbound train 20EB121 was hit head on by westbound train 21ZC320 at milepost CD280.7 ( Main Track #2) on the Toledo East District of the Dearborn Division.
The crew on train 20EB121 stated the signal at Control Point 281 was displaying a stop signal and the previous signal located at milepost CD283 had displayed a clear signal indication. The engineer stated he was traveling at about 40 MPH when he saw the stop signal indication and after confirming this with his conductor he placed the train in emergency. The train continued east going past the signal at CD281 and through the double crossover interlocking. The western most switch was lined for movement on Main 2 and the eastern most switch was lined for a west bound move from Main 2 to Main 1. This switch was run through by train 20EB121 on a trailing point move. The train then came to a stop with the lead locomotive on Main 2 just east of the west bound signal, milepost 280.7. The crew heard the west bound train 21ZC320 calling signals just east of their location. The crew on 20EB121 called the Toledo East Dispatcher and announced they had gone by the stop signal. The crew also stated they called the crew on train 21ZC320 over the radio and told the crew that they were by the signal at CD 281 and were fouling the interlocking on main 2 and for them to bring their train to a stop. The crew on train 20EB121 stated they then dismounted their train and ran from the tracks in a southerly direction.
The crew on train 21ZC320 was traveling west on main track # 2 and had just past the signal at milepost CD 279 (approach limited) when they heard the track side analyzer at milepost CD 283 announce the passing of a train on main 2 traveling east. The crew then heard the crew on train 20EB121 on the radio stating they (20E) were fouling the interlocking at CD 281. Engineer West stated he applied air and his conductor placed the train in emergency from the conductors emergency brake lever. Mr. West stated his conductor left out the front door of the cab and dismounted the train at a speed between 20-30 MPH from the south side of the train. Mr. West stated he placed the train dynamic brakes in number 8 notch and then braced himself against the control stand. Mr. West stated he estimated the train speed at impact to be between 15-20 MPH.
1. The method of train operation was as follows:
NORAC rules are in effect. Norac rule 261 territory.
Eastbound train 20EB121 passed the stop signal CP281 Main 2 at milepost CD 281. Their train continued on

Main 2, into the interlocking, through a trailing point switch and stopped east of the west bound signal, milepost CD 280.7.
Westward train 21ZC320 also located on Main 2, was informed via radio, by train 20EB121 to stop immediately as they, the crew on train 21ZC320, had gone past the stop signal at CP 281. Train 21ZC320 placed their train in emergency. Train 21ZC320 continued west and struck train 20EB121 head-on at a recorded 19 MPH.
The NS Train Dispatcher had intended for Eastward train 20EB121 to stop on main track # 2 west of CP-281.
Westward train 21Z320 also on Maine 2, was lined to crossover from main track #2 to main track #1 at milepost CD 280.8, east of the stopped 20EB121.
In interviews with crew members on Eastward train 20EB121stated that the approach signal to CP 281 located at milepost CD 283 was displaying a clear indication. They traveled approximately 1 1/2 miles until noticing the home signal at CP-281 was displaying a stop indication. They immediately placed their train into emergency.
During interviews with engineer on westward train 21Z320 stated that he was proceeding west on main track # 2 at approximately 38 to 40 MPH, when they received a radio transmission from 20EB121 to stop their train.
During post accident interviews the crew members on train 20EB281 stated they both saw the signal prior to the stop signal displaying an clear indication. When asked if they looked at the signal as their train proceeded past the signal neither crew member could respond positively. The conductor stated he was still checking paperwork and organizing the cab and the engineer stated he may have been distracted by a train (353l820) on the adjacent siding (south side of main track two). The crew on train 353L820 had cut their train at a highway grade crossing at milepost CD 283. This crossing is located just west of the signal which the crew stated displayed a clear signal. The engineer stated he may have been distracted when he was watching for traffic and blowing the engine horn for the crossing. Neither crew member could say they looked at the signal as they went past it.
Both trains were inter-modal trains. The 21Z had double stack cars through out the train and the 20 E had signal containers/trailers on flat cars.
The collision of the two trains resulted in the following derailed cars and engines:
- 20EB121, trailing engine 2628 rear trucks derailed,
lead car RTTX 165400 all wheels A end,
5th car RTTX 370800 (articulating car) 2 and 3 section derailed all wheels (2 sections of a 3 section car)
6th car TTAX 553180 all wheels A end
- 21ZC320 leading engine 9868 axle #3 derailed,
lead car DTTX 432022 (3 section articulating car ) all wheels all three sections derailed
2nd car BNSF 240743 all wheels on A end.
The track in this area is double mainline running east to west. The track in the area is tangent track with a 1 degree curve running 8/10 of a mile long just east of the accident site.

(Equipment damage)
Track $6,000
Equipment Cars, $310,332
Locomotive $68,003.
Signals 0
Total = $378,335

(Re-railing and track restoration)
Hulchers and R.J Corman were called for re-railing operations. Hulchers arrived at 3:45 Pm and R.J. Corman arrived at 4:30. Each company brought two side-winders each.
Last car was re-railed at 10:45 PM
First train over main one at 10:15 PM
First train over main two 4:00 AM
Hospital train departed with wrecked cars at 3:32 AM to Toledo.

(Injuries)
There was one injury associated with this incident. The conductor on train 21EZ320 jumped off the leading locomotive of his train just prior to the collision with 20EC121. He was transported to St. Charles Mercy Hospital in Oregon, Ohio. He had multiple injuries: a laceration on the left side of his forehead, a laceration to his left eye, a cervical strain to his neck, a contusion to both knees and heals and abrasions to both hands. The laceration on his forehead was closed with a staple and the laceration on his eye was closed with five stitches. He was kept overnight at the hospital for observation.

Analysis and Conclusions:
Both of the lead engines, NS 9716 on train 20EB121 and NS 9868 on train 21ZC320 were both equipped with

Rail View Cameras. The data from these cameras was downloaded and reviewed. The data from the camera of train 20EB121, traveling east, revealed the approach signal at milepost CD283 displayed an approach signal indication not a clear signal as stated by the crew. Voice recording tapes of the crew on train 20EB121 revealed the crew called the signal as a clear. The camera also recorded the control point signal at milepost CD 281. This signal displayed a stop signal indication. The crew placed their train in emergency but passed the stop signal before bringing their train to a stop. This data clearly showed the crew missed the signal indication at milepost CD 283 which ultimately caused them to pass the stop signal at milepost CD 281. Testng of the signal system confirmed the system worked as intended.
(Signals)
The signal systems at this location are conventional relay logic type and are controlled by a train dispatcher, Toledo East, in Dearborn, Michigan. This signal system has non-coded DC tracks, GRS model 5H power switches, and uses GRS plug-in relays for control and indication. The color-light signals use GRS G style signal heads and are mounted on signal bridges 25 feet above the tracks. The 282 2E signal, milepost CD 283, has two signal heads: the top head has a yellow, a green and a red aspect. The lower head has a green and red aspect. For a clear signal at milepost CD 283 the top signal head would display a green aspect and the bottom head would be red. For an approach indication, the top head would display a yellow aspect while the bottom head would be red.
After the accident the Chief Engineer of Signals for the NS Northern Region had all signal instrument cases locked and sealed. Testing of the signal system was conducted by FRA Signal Inspector, Terry Ellis. Testing indicated the system was in compliance with all FRA Part 236 guidelines. Signal test records of the affected locations were also inspected with no exceptions noted. Sight distance testing was also conducted the day following the accident. The signals were found to be in good focus and alignment.
Note: Lead engines on both trains were equipped with Rail View cameras. The video data was inspected by FRA Operating Practices and Safety Inspector Mark Pruden and FRA Signal Inspector Terry Ellis. The video data from the Rail View camera on the lead engine on train 20E clearly shows the signal aspect the crew called clear at CD 283 was an approach signal. Audio tapes from the Dearborn Dispatchers office recorded the crew calling this signal clear. The signal at CD 281 was displaying a stop signal indication.
(Track)
The track in this area is double mainline running east to west. The track in the area is tangent track with a 1 degree curve running 8/10 of a mile long just east of the accident site.
(Equipment)
Both trains involved in this accident had Class 1 Brake Tests performed. This brake test on train 20EB121 was performed on October 21, 2005 at 47th Street Yard in Chicago, IL and the 21ZC320's brake test was performed on October 20, 2005 at Rutherford Yard in Harrisburg, PA . Both trains were inspected after the accident no exceptions noted except for one car in train 20EB121, RTTX 600801 was found to have ineffective air brakes (piston travel of 12 inches, 1 ½ inch longer than the 10 ½ inch maximum). Daily inspections on all locomotives were conducted on October 21. Lead locomotive on train 21ZC320, NS 9868 had it's last periodic inspection conducted on October 15, 2005 in Elkhart, IN. The periodic inspection of the trailing locomotive, NS 9891 was conducted on October 3, 2005 in Roanoke, VA.. The periodic inspection on the lead locomotive on train 20EB121, NS 9716 was conducted on September 22, 2005 in Linwood, NC and the trailing unit NS 2628 at Altoona, PA on September 13, 2005.

Accident Cause:
The crew on train 20E failed to observe and identify the correct signal indication at milepost CD 283. Instead of responding to an approach signal indication the crew called the signal a clear and continued traveling east at about 45 MPH. The crew then failed to stop short of a stop signal indication at milepost CD 281.

An investigation of the incident was held by Norfolk Southern and found both crew members on train 20E at fault for failing to stop for a stop signal indication. Both crew members have been dismissed from service for passing a stop signal indication without authority. The FRA concures with the finding of Norfolk Southern.