Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-81

Norfolk Southern Corp (NS)
New Brighton, PA
October 20, 2006

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2006-81

1.Name of Railroad Operating Train #1: Norfolk Southern Corp. [NS]	1a. Alphabetic Code: NS	1b. Railroad Accident/Incident No.: D26865
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident: N/A
3.Name of Railroad Responsible for Track Maintenance: Norfolk Southern Corp. [NS]	3a. Alphabetic Code: NS	3b. Railroad Accident/Incident No.: D26865
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 10 / Day 20 / Year 2006	6. Time of Accident/Incident: 10:41:00 ☐ 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): 01

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
80	23	20	100	PITTSBURGH

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
NEW BRIGHTON	PC29.26	N/A	PA	BEAVER

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
42 F		4		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
FORT WAYNE LINE #1		4	63.0		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: 1

26. Was Equipment Attended? 1. Yes 2. No: 1

27. Train Number/Symbol: 68QB11

28. Speed (recorded speed, if available) R - Recorded E - Estimated: 37 MPH; Code: R

29. Trailing Tons (gross tonnage, excluding power units): 10751

30. 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): e, N/A, N/A, N/A, N/A

30a. 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: 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	23	yes
(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
0	0

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	35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	3	0	0	0	0	(1) Total in Equipment Consist	80	0	3	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	23	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
1388755	325000	T220	N/A

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	0	1	0

Length of Time on Duty

44. Engineer/Operator: Hrs 08 Mi 11

45. Conductor: Hrs 08 Mi 11

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	0

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

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

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

53. Was Equipment Attended? 1. Yes 2. No: N/A

54. Train Number/Symbol: N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated: N/A MPH; Code: N/A

57. Method(s) of Operation (enter code(s) that apply): a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A		N/A	N/A
(2) Causing (if mechanical cause reported)	N/A	N/A	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	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

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

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

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

76. EOT Device? 1. Yes 2. No	77. Was EOT Device Properly Armed? 1. Yes 2. No
N/A	N/A

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	88. Signaled Crossing Warning Code (See instructions for codes)	89. Whistle Ban Code 1. Yes 2. No 3. Unknown
Code(s): N/A N/A N/A N/A N/A N/A N/A	N/A	N/A

90. Location of Warning Code 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	91. Crossing Warning Interconnected with Highway Signals Code 1. Yes 2. No 3. Unknown	92. Crossing Illuminated by Street Lights or Special Lights Code 1. Yes 2. No 3. Unknown
N/A	N/A	N/A

93. Driver's Age	94. Driver's Gender Code 1. Male 2. Female	95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code 1. Yes 2. No 3. Unknown	96. Driver Code 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)
N/A	N/A	N/A	N/A

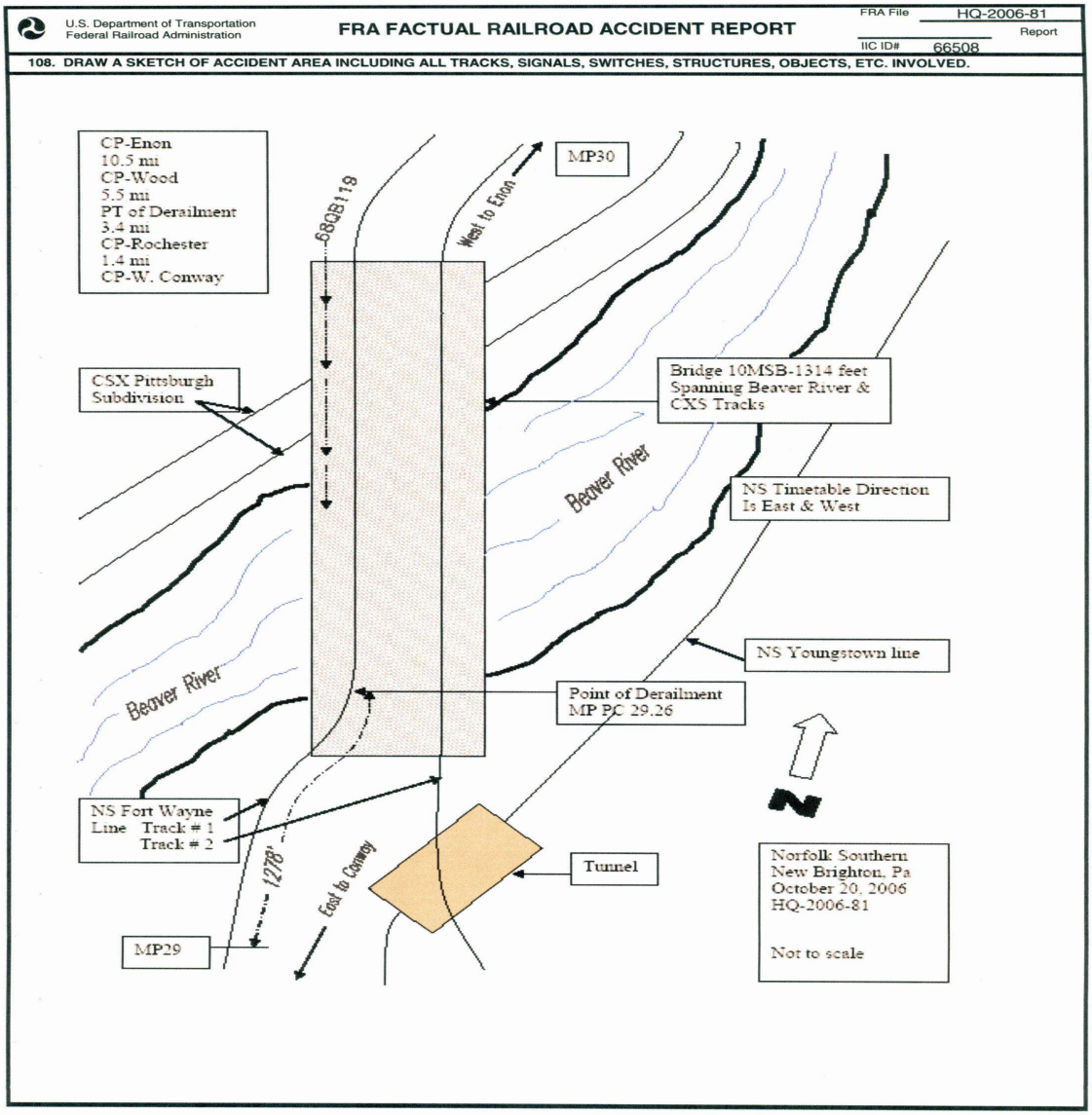
97. Driver Passed Standing Highway Vehicle Code 1. Yes 2. No 3. Unknown	98. View of Track Obscured by (primary obstruction) Code 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed
N/A	N/A

101. Casulties to Highway-Rail Crossing Users	Killed	Injured	99. Driver Was Code 1. Killed 2.Injured 3. Uninjured	100. Was Driver in the Vehicle? Code 1. Yes 2. No
	N/A	N/A	N/A	N/A
			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 1. Yes 2. No	105. Locomotive Auxiliary Lights Operational? Code 1. Yes 2. No
N/A	N/A
106. Locomotive Headlight Illuminated? Code 1. Yes 2. No	107. Locomotive Audible Warning Sounded? Code 1. Yes 2. No
N/A	N/A

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

SKETCH
HQ-2006-
81.jpg



109. SYNOPSIS OF THE ACCIDENT

An eastbound NS freight train derailed on a bridge on October 20, 2006, at 10:41 p.m. The accident occurred in the city of New Brighton, Pennsylvania, at NS Milepost PC 29.3, on the Fort Wayne Line of the Pittsburgh Division.

Twenty-three tank cars loaded with Ethanol derailed resulting in a fire and explosion. There were no injuries to the train crew, nor local citizens. However, approximately 100 residents were evacuated from nearby homes and businesses. The derailed tank cars sustained damage in the amount of $1,388,755. Cost of damage to track and structures was $325,000.

At the time of the derailment it was dark and cloudy. The temperature was 42°F.

The derailment was caused by a broken rail.

110. NARRATIVE

The crew of eastbound train NS 68QB119 included a locomotive engineer and a conductor. They first went on duty at 2:30 p.m., EDT, October 20, 2006 at Toledo, Ohio. Toledo is the away -from-home terminal for both crew members, and each of them received more than the statutory off duty period, prior to reporting for duty.

Their assigned freight train consisted of three locomotives, three empty buffer cars, and 80 loaded tank cars of Ethanol . It was 5,327 feet long, and weighed 10,745 tons. This unit train was scheduled to travel to Conway, Pennsylvania. The train was a relay train (run-through) and arrived at Toledo approximately 4:15 p.m. The crew boarded Train 68QB 119 at 4:20 p.m., after a job briefing with the inbound crew. The engineer inspected the locomotives and cut out the dynamic brake of the third engine to comply with trailing tonnage requirements to limit excessive buff forces per NS-1(Rules for Equipment Operation and Handling). The train departed Toledo at 4:30 p.m.

The train proceeded without incident toward Conway, Pennsylvania.

As the eastbound train approached the accident area, the locomotive engineer was seated at the controls on the south side of the leading locomotive. The conductor was seated on the north side of the leading locomotive.

In this area of the railroad there are in succession, a 1.7 degree curve to the left of about 540 feet, compounding to a 2.5 degree curve to the left of approximately 1100 feet, a tangent 1500 feet in length, a 0.4 degree curve to right for 525 feet, a tangent 495 feet in length, a 3.5 degree curve to the left for 650 feet, a tangent of about 1050 feet, to a 0.8 degree curve to the right for 400 feet to the point of derailment and 40 feet beyond to a tangent of 100 feet, followed by a 0.8 degree curve to the left for 1000 feet. The grade is 0.47 percent descending.

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

The Accident

The train was being operated at 38 mph approaching the accident area. At the time the accident occurred the train was being operated at 37 mph. Both speeds were recorded by the event recorder of the controlling locomotive. The maximum authorized speed for freight trains is 45 mph, as designated in the current NS Timetable No. 4.

As the leading locomotive reached a point approximately two to three hundred yards east of the Beaver River bridge, a train-line initiated emergency brake application occurred. The train traveled 826 feet after the application, coming to a normal stop. The crew then saw a bright flash in the sky to their rear. The locomotive engineer announced an emergency via the engine radio and contacted the train dispatcher to report the fire and explosion. The crew left the locomotive and called “911" on a cell phone to report the situation.

The crew said they neither saw, nor felt anything unusual prior to the derailment. They also stated there were no equipment problems during the trip.

The 23rd through the 45th cars (a total of 23 cars) of the 83-car train of ethanol alcohol derailed on the bridge over the Beaver River. Seventeen of the derailed cars stacked up in accordion fashion forcing 13 of them off the bridge with five of them in the river. Twenty-one of the derailed tank cars were involved in the fire and released product.

The NS trainmaster and assistant terminal superintendent took the crew to Beaver County Medical Center for post accident toxicological testing.

The following lists the derailed cars by initial and number, position in the train, and quantity of product released:

UTLX 203011 - 23rd - 20 gallons
TILX 191604 - 24th - 0 "
TILX 192507 - 25th - 21,748 "
NATX 301007 - 26th - 0 "
TILX 192522 - 27th - 27,613 "
SHPX 206699 - 28th - 22,738 "
NATX 300720 - 29th - 28,723 "
NATX 300794 -30th - 28,706 "
NATX 301081 - 31st - 28,720 "
SHPX 205883 - 32nd - 28,771 "
NATX 301562 - 33rd - 28,740 "
UTLX 203372 - 34th - 28,785 "
UTLX 203398 - 35th - 28,699 "
NATX 301513 - 36th - 21,218 "
GATX 200539 - 37th - 13,209 "
NATX 300765 - 38th - 28,720 "
NATX 301591 - 39th - 28,721 "
TILX 190780 - 40th - 28,670 "
NATX 300741 - 41st - 8,738 "
NATX 301084 - 42nd - 28,754 "
SHPX 205909 - 43rd - 28,721 "
NATX 301037 - 44th - 25,264 "
DUBX 301106 - 45th - 0 "

There were no fatalities or injuries as a result of the derailment or exposure to the released Ethanol.

Numerous city and county emergency responders, fire and police personnel rushed to the derailment site where the Beaver County Emergency Director established incident command. In response to the intense heat and smoke from the fire, the emergency response director ordered the evacuation of a seven square block area of New Brighton which affected approximately 100 people. The evacuation was lifted approximately 36 hours later when it was determined the situation was under control.

Federal Railroad Administration (FRA) and National Transportation Safety Board (NTSB) personnel arrived at the scene and initiated an investigation into the cause of the accident.

Air and water quality monitoring began the morning of October 21, 2006, by the Center for Toxicology and Environmental Health, LLC (CTEH). No significant amounts of contaminants were detected from various sites along the Beaver River, but the soil around the derailment site was saturated with Ethanol.

Analysis and Conclusions
Analysis

The crew was tested as prescribed by post accident guidelines of 49 CFR, Part 219, Subpart C. The test results were negative.

Evaluation of the data from the event recorder of the controlling locomotive by NS managers and FRA Operating Practices Inspectors revealed the train was operated in compliance with NS Operating Rules. Train handling was ruled out as a factor in the derailment.

Following the derailment, all the signal cases between and including CP Wood and CP Rochester were sealed with numbered box car seals by NS Communications and Signal (C&S) personnel. Box car seals were also applied to the crossing case at 15th St, Beaver Falls and the Beaver Falls hot box detector. There were neither hand switches nor signals in this block to seal. The data logs from the Green Tree office were downloaded and the tapes from the hot box detectors at PC 30.6 Beaver Falls, PA, and PC 50.2 East Palestine, Ohio, were remotely downloaded from the Green Tree office for train 68Q and 10R,the preceding train. Both operated on Fort Wayne Line # 1 track. Both hot box detector data downloads, from both trains were defect free.

On October 22, 23, and 24, 2006, NS Signal Department personnel and the FRA's Signal and Train Control (S&TC) Inspector removed the seals and conducted extensive tests of the wayside cab signal system traversed by the train prior to the accident and the cab signal equipment of the controlling locomotive. The signal systems functioned as intended.

The Locomotive Inspection and Repair Records (FRA Form F6180-49A) were reviewed for all three locomotives. No exceptions were taken to the periodic inspection information or the air brake inspection dates. The records of the locomotive calendar day inspection forms were reviewed and indicated the locomotives were in date and had been inspected. No exceptions were noted.

An inspection of the non-derailed portion of 68QB119 was conducted jointly by NTSB, FRA, and NS personnel. The piston travel, brake rigging, wheels, and general equipment conditions were noted. Exceptions were taken for one broken brake shoe and two worn brake shoes.

Inspection of the tank cars by FRA and NTSB inspectors revealed catastrophic damages including rips in the tank shells which caused breaches in the tanks, releasing Ethanol, which then ignited into an intense fire. Damages included 12 cars with tears in the shell, 8 cars with either valve damage, or with the valves and or fittings sheared off. Three of the cars had no loss of product. The total quantity of product lost was 485,278 gallons, which fueled the intense 16 hour fire. The 28th car in the consist, SHPX 206699, had no significant damage to the shell or the fittings. However, it was subject to intense fire from both sides, as well as from below. The resulting heat caused a mechanical tear in the shell from the build-up of internal pressure from the Ethanol inside the tank.

The train consist documents were accurate and contained the required information. The inspectors took no exception to train placement or the condition of the tank cars prior to the derailment.

FRA and NTSB track inspectors, along with personnel from NS's Engineering Department examined the track in the area of the accident. Post accident track geometry measurements were taken on October 22, 2006. No exceptions to FRA's Track Safety Standards (TSS) were found in the non-disturbed track west of the point of derailment. The inspection team found seven broken pieces of rail from the north rail of main track No. 1. Five "detail fractures from shelling" were evident on the fracture faces of the rail heads. The length of the broken pieces, from west to east, were: 60.5 inches, 14 inches, 49 inches, 59 inches, 48 inches, 5 inches, and a 6 inch triangle shaped piece of rail base. The location of the broken rail pieces was determined to be the point of derailment.

The local NS track inspector made a visual inspection of this track by hi-rail vehicle on October 20, 2006, and according to his inspection report for that date, cited no exceptions. The NS's track geometry car inspected the track in the accident area on October 2, 2006, and found no track geometry exceptions on the bridge. The investigative team reviewed the railroads track inspection records for the accident area for June 1, 2006 through October 20, 2006. The TSS requires the track in the accident area to be inspected twice weekly and NS met this requirement. The records indicate no recurring problems in the accident area. The last FRA inspection over the main track was on April 18, 2006. Again, no exceptions were noted in the accident area.

In addition to the above, the TSS require a continuous search for internal rail defects in Class 4 track once every 40 million gross tons (mgt). As such, NS is required

to test this track twice a year but this carrier chooses to test this track four times per year. The inspections are performed by Sperry Rail Service (SRS) under contract to NS. On August 1, 2006, SRS found a defect on track No. 1 at MP PC 29.271 which is on the bridge. The defective section of rail was removed the same day. The replacement rail, which abutted the suspect defective rail at the point of derailment, was field welded in track on October 10, 2006. The SRS test of April 18, 2006, found two defects on main track No. 1 on the bridge at MP PC 29.279 and MP PC 29.25. These defects were also removed and replacement rail installed. SRS tested the same track on January 20, 2006, and found no defects. The fourth test of this track in 2006 was scheduled for November 2006. The rail in main track No. 1 is 140 lb. American Railway Engineering Association (RE) design section which was rolled in July 1976 by Illinois Mill of US Steel Company.

The investigative team interviewed the Vice President of Sperry Rail Service to determine why the test by SRS on August 1, 2006, had not detected the presence of the detail fractures in the rail at the point of derailment. He stated the recovered pieces of broken rail exhibited rail-head surface conditions from shelling and a loss of signal from one channel did occur in the area of the point of derailment. The shelling condition may have interfered with the ultrasonic signal returning from the base of the rail on an intermittent basis.

There are 24 separate channels sending and receiving ultrasonic signals used in the test vehicle that examined the rail prior to the accident. Of these channels, the zero channel transmits the only ultrasound signal vertically down into the rail and it is the only one where existing technology can determine if there is a “loss of bottom” signal. Loss of bottom means that the ultrasonic signal did not penetrate the rail all the way to the bottom (base) of the rail and reflect back up to the probe. According to personal with the requisite experience and technical qualification in non-destructive testing of rail, the intermittent loss of data from the zero channel does not always constitute an invalid or non-continuous test. More specifically, the test car operator will account for other factors such as general rail condition (rail surface, weather, rail wear, etc.) to make a determination if a loss of the zero channel would be a trigger to determine if there is a non-continuous (invalid) test at a suspect spot. In the case of the location of this derailment, SRS made the determination that the test on August 1, 2006, was a valid or continuous test. Moreover, if the fractures did exist at the time of the test, there is no way to know whether they were of a detectable size, even with a complete reflection of the ultrasound back up from the bottom of the rail. More importantly, the zero channel ultrasound is incapable of detecting discontinuities in the transverse plane of the rail (e.g., detail fractures).

A 1998 research paper from the Volpe Transportation Center entitled “Propagation Analysis of Transverse Defects Originating at Lower Gage Corner of Rail” reported the analytical finding that “rail defect growth for a detail fracture has been calculated to be approximately 2% per million gross tons (MGT).” The annual density on main track No. 1 in the accident area is 63.0 mgt. However, the tonnage varies from day to day, from week to week, and month to month. There is no record of accumulated MGT’s post the accident date. Thus, calculating when the defects began to appear, and their growth rate, can be speculation at best. It is doubtful that it can be determined if the detail fracture which caused the rail to break may have been present in a detectable size at the time of the Sperry Rail Service test in August 2006.

Conclusions

Absent any quantifiable evidence the defect at the point of derailment was present in a detectable size on August 1, 2006, or that the test was not continuous, the railroad was in compliance with its policies and all applicable Federal Track Safety Standards requirements. Their frequency for non-destructive testing of internal rail defects significantly exceeds Federal requirements. Post accident investigations found no problems or history of problems with track geometry, signal, locomotives, or equipment of train 68QB119. There were no concerns associated with the actions of the crew before, during, or after the derailment.

Probable Cause

The north rail of main track No.1 failed under traffic as train 68QB119 passed over the Beaver River Bridge causing the derailment. The rail failed due to the presence of five detail fractures in the head of the rail. The largest of the detail fractures was 70% of the rail- head.

The Federal Railroad Administration determined the probable cause was a broken rail.