



***Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-31***

***Norfolk Southern Corporation (NS)
Salem, VA
June 29, 2009***

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.

1. Name of Railroad Operating Train #1 Norfolk Southern Corp. [NS]		1a. Alphabetic Code NS		1b. Railroad Accident/Incident No. 036633	
2. Name of Railroad Operating Train #2 N/A		2a. Alphabetic Code N/A		2b. Railroad Accident/Incident No. N/A	
3. Name of Railroad Operating Train #3 N/A		3a. Alphabetic Code N/A		3b. Railroad Accident/Incident No. N/A	
4. Name of Railroad Responsible for Track Maintenance: Norfolk Southern Corp. [NS]		4a. Alphabetic Code NS		4b. Railroad Accident/Incident No. 036633	
5. U.S. DOT_AAR Grade Crossing Identification Number 469389U		6. Date of Accident/Incident Month 06 Day 29 Year 2009		7. Time of Accident/Incident 08:35:00 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	
8. Type of Accident/Incident (single entry in code box)					
1. Derailment		4. Side collision		7. Hwy-rail crossing	
2. Head on collision		5. Raking collision		10. Explosion-detonation	
3. Rear end collision		6. Broken Train collision		11. Fire/violent rupture	
		9. Obstruction		12. Other impacts	
				13. Other (describe in narrative)	
Code 07					
9. Cars Carrying HAZMAT 0		10. HAZMAT Cars Damaged/Derailed N/A		11. Cars Releasing HAZMAT N/A	
				12. People Evacuated 0	
				13. Division Virginia	
14. Nearest City/Town Salem		15. Milepost (to nearest tenth) 268.5		16. State Abbr Code VA 51	
				17. County ROANOKE	
18. Temperature (F) (specify if minus) 73 F		19. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 2		20. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 1	
				21. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1	
22. Track Name/Number Main #2		23. FRA Track Code Class (1-9, X) 4		24. Annual Track Density (gross tons in millions) 37	
				25. Time Table Direction Code 1. North 3. East 2. South 4. West 4	

OPERATING TRAIN #1

26. Type of Equipment Consist (single entry)		1. Freight train		4. Work train		7. Yard/switching		A. Spec. MoW Equip. Code		27. Was Equipment Attended? Code		28. Train Number/Symbol	
		2. Passenger train		5. Single car		8. Light loco(s).				1. Yes 2. No		771V428	
		3. Commuter train		6. Cut of cars		9. Maint./inspect.car							
29. Speed (recorded speed, if available) Code R - Recorded E - Estimated 44 MPH R		31. Method(s) of Operation (enter code(s) that apply)						31a. Remotely Controlled Locomotive?					
		a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track c. Auto train stop i. Time table/train orders o. Positive train control d. Cab j. Track warrant control p. Other (Specify in narrative) e. Traffic k. Direct traffic control Code(s) f. Interlocking l. Yard limits						0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter					
30. Trailing Tons (gross tonnage, excluding power units) 2695												0	
32. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded(yes/no)		33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.					
(1) First involved (derailed, struck, etc)		NS9784		1		N/A						Alcohol N/A	
(2) Causing (if mechanical cause reported)		0		0		N/A						Drugs N/A	
												34. Was this consist transporting passengers? (Y/N) N	

35. Locomotive Units		a. Head End		Mid Train		Rear End		36. Cars		Loaded		Empty	
				b. Manual		c. Remote				a. Freight		b. Pass.	
										c. Freight		d. Pass.	
										e. Caboose			
(1) Total in Train		2		0		0		(1) Total in Equipment Consist		0		0	
(2) Total Derailed		0		0		0		(2) Total Derailed		0		0	

37. Equipment Damage This Consist \$8,000.00		38. Track, Signal, Way, & Structure Damage \$0.00		39. Primary Cause Code H991		40. Contributing Cause Code N/A	
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Number of Crew Members				Length of Time on Duty							
41. Engineer/Operators 1		42. Firemen 0		43. Conductors 1		44. Brakemen 0		45. Engineer/Operator Hrs 1 Mi 20		46. Conductor Hrs 1 Mi 20	

Casualties to:		47. Railroad Employees		48. Train Passengers		49. Other		50. EOT Device? 1. Yes 2. No 1		51. Was EOT Device Properly Armed? 1. Yes 2. No 1	
Fatal		0		0		0					
Nonfatal		0		0		0		52. Caboose Occupied by Crew? 1. Yes 2. No		2	

OPERATING TRAIN #2

53. Type of Equipment Consist (single entry)		1. Freight train		4. Work train		7. Yard/switching		A. Spec. MoW Equip. Code		54. Was Equipment Attended? Code		55. Train Number/Symbol	
		2. Passenger train		5. Single car		8. Light loco(s).				1. Yes 2. No		N/A	
		3. Commuter train		6. Cut of cars		9. Maint./inspect.car		N/A					
56. Speed (recorded speed, if available) Code R - Recorded E - Estimated 0 MPH N/A		58. Method(s) of Operation (enter code(s) that apply)						58a. Remotely Controlled Locomotive?					
		a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track						0 = Not a remotely controlled 1 = Remote control portable					

57. Trailing Tons (<i>gross tonnage, excluding power units</i>)	N/A	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 (<i>Specify in narrative</i>) 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

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First involved (<i>derailed, struck, etc</i>)	0	0	N/A		N/A	N/A
(2) Causing (<i>if mechanical cause reported</i>)	0	0	N/A	61. Was this consist transporting passengers? (Y/N)		N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual	c. Remote	Rear End d. Manual	e. Remote	63. Cars	Loaded a. Freight	b. Pass.	Empty c. Freight	d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist	\$0.00	65. Track, Signal, Way, & Structure Damage	\$0.00	66. Primary Cause Code	N/A	67. Contributing Cause Code	N/A
Number of Crew Members				Length of Time on Duty			

68. Engineer/Operators	0	69. Firemen	0	70. Conductors	0	71. Brakemen	0	72. Engineer/Operator	Hrs 0 Mi 0	73. Conductor	Hrs 0 Mi 0
Casualties to:		74. Railroad Employees		75. Train Passengers		76. Other		77. EOT Device?		78. Was EOT Device Properly Armed?	
Fatal	0	0	0	0	0	0	0	1. Yes 2. No N/A		1. Yes 2. No N/A	
Nonfatal	0	0	0	0	0	0	0	79. Caboose Occupied by Crew?		1. Yes 2. No N/A	

OPERATING TRAIN #3

80. Type of Equipment Consist (<i>single entry</i>)	1. Freight train	4. Work train	7. Yard/switching	A. Spec. MoW Equip.	Code	81. Was Equipment Attended?	Code	82. Train Number/Symbol
	2. Passenger train	5. Single car	8. Light loco(s).		N/A	1. Yes 2. No N/A	N/A	N/A
	3. Commuter train	6. Cut of cars	9. Maint./inspect.car					

83. Speed (<i>recorded speed, if available</i>)	Code	85. Method(s) of Operation (<i>enter code(s) that apply</i>)	85a. Remotely Controlled Locomotive?
R - Recorded		a. ATCS	0 = Not a remotely controlled
E - Estimated	N/A MPH N/A	b. Auto train control	1 = Remote control portable
		c. Auto train stop	2 = Remote control tower
84. Trailing Tons (<i>gross tonnage, excluding power units</i>)	N/A	d. Cab	3 = Remote control transmitter - more than one remote control transmitter
		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 (<i>Specify in narrative</i>)	
		Code(s)	
		N/A N/A N/A N/A N/A	N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First involved (<i>derailed, struck, etc</i>)	N/A	N/A	N/A		N/A	N/A
(2) Causing (<i>if mechanical cause reported</i>)	N/A	N/A	N/A	88. Was this consist transporting passengers? (Y/N)		N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual	c. Remote	Rear End d. Manual	e. Remote	90. Cars	Loaded a. Freight	b. Pass.	Empty c. Freight	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

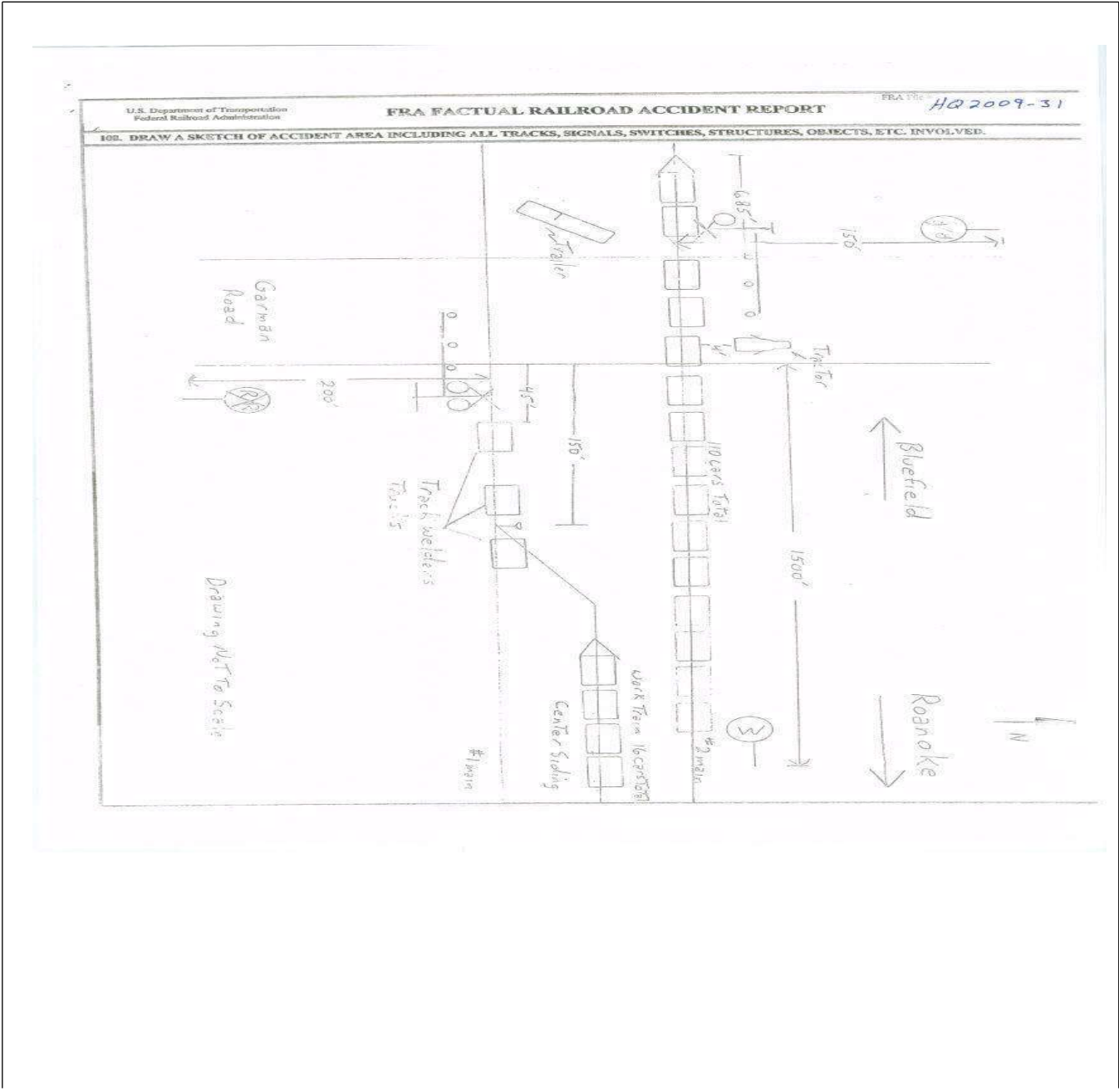
91. Equipment Damage This Consist	N/A	92. Track, Signal, Way, & Structure Damage	N/A	93. Primary Cause Code	N/A	94. Contributing Cause Code	N/A
Number of Crew Members				Length of Time on Duty			

95. Engineer/Operators	N/A	96. Firemen	N/A	97. Conductors	N/A	98. Brakemen	N/A	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		104. EOT		105. Was EOT Device Properly	
Fatal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1. Yes 2. No N/A		1. Yes 2. No N/A	
Nonfatal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	106. Caboose Occupied by Crew?		1. Yes 2. No N/A	

Highway User Involved				Rail Equipment Involved					
107.	C. Truck-Trailer	F. Bus	J. Other Motor Vehicle	Code	111. Equipment	3. Train (<i>standing</i>)	6. Light Loco(s) (<i>moving</i>)	Code	
	A. Auto	D. Pick-Up Truck	G. School Bus	K. Pedestrian	1. Train(<i>units pulling</i>)	4. Car(s) (<i>moving</i>)	7. Light(s) (<i>standing</i>)		
	B. Truck	E. Van	H. Motorcycle	M. Other (<i>spec. in narrative</i>)	2. Train(<i>units pushing</i>)	5. Car(s) (<i>standing</i>)	8. Other (<i>specify in narrative</i>)	1	
108. Vehicle Speed (<i>est. MPH at impact</i>)	15	109. <i>geographical</i>		Code	112. Position of Car Unit in				
		1. North	2. South	3. East	4. West	1			

110. Position 1. Stalled on Crossing 2. Stopped on Crossing 3. Moving Over Crossing 4. Trapped				Code 3	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User				Code 1	
114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither				Code 4	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither				Code 4	
114c. State here the name and quantity of the hazardous materials released, if any. N/A										
115. Type Crossing 1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig Wags 5. Hwy. traffic signals 6. Audible Warning 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other (spec. in narr.) 12. None				Code 05	116. Signaled Crossing (See instructions for codes)				Code 2	
117. Whistle Ban 1. Yes 2. No 3. Unknown										
Code(s)		01	N/A	N/A	N/A	N/A	N/A	N/A		
118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach				Code 1	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown				Code 2	
120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown										
121. Age 30		122. Driver's Gender 1. Male 2. Female		Code 1	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown				Code 2	
124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop						124. Driver 4. Stopped on Crossing 5. Other (specify in narrative)				Code 5
125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown				Code 2	126. View of Track Obscured by (primary obstruction) 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed				Code 2	
Casualties to:		Killed	Injured	127. Driver 1. Killed 2. Injured 3. Uninjured				Code 3	128. Was Driver in the Vehicle? 1. Yes 2. No	Code 1
129. Highway-Rail Crossing Users		0	0	130. Highway Vehicle Property Damage (est. dollar damage)				0	131. Total Number of Highway-Rail Crossing Users (include driver)	
132. Locomotive Auxiliary Lights? 1. Yes 2. No				Code 1	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No				Code 1	
134. Locomotive Headlight Illuminated? 1. Yes 2. No				Code 1	135. Locomotive Audible Warning Sounded? 1. Yes 2. No				Code 1	

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



137. SYNOPSIS OF THE ACCIDENT

On June 29, 2009, at 8:35 A.M., NS Freight Train No.771V428 operating westbound on number two main track with 2 locomotives and 110 empty coal hoppers struck a tractor-trailer at the highway-rail grade crossing at Garman Road, near Salem, Virginia. Norfolk Southern has estimated the damage to the locomotive at \$8,000. The tractor was not damaged but the trailer was destroyed. Repeated calls and messages left with the trucking company went unanswered, therefore a monetary value was not able to be obtained with regards to the equipment that was destroyed in the collision. There was no damage to track structure or signal system.

At the time of the accident it was clear and sunny, with a light breeze. The temperature was 70° F.

Track personnel working on number one track had the proper authority to work with track equipment positioned east and west of the highway crossing. NS Signal personnel were working with the assistant track foreman disabling the detection circuit on number one track. The warning system had been activated due to the presence of the track equipment working on number one track.

The accident's cause was determined to be an assistant track foreman voluntarily raising the crossing warning system gate without making sure the way was clear, and waving a truck across the tracks into the path of the oncoming train.

138. NARRATIVE

Circumstances prior to the Accident

The crew of Norfolk Southern (NS) train 771V428 included a locomotive engineer and a conductor. They went on duty on June 29, 2009 at 7:15 a.m. E.D.T. at Roanoke, Virginia. Roanoke is the home terminal for both crew members. Both employees had received more than the statutory off duty period before reporting for duty.

Their assigned freight train consisted of two locomotives and 110 empty cars. The train was scheduled to travel from Roanoke, Virginia to Bluefield, West Virginia. They were not scheduled to make any stops en route. The train received an initial airbrake test at Roanoke, Virginia, at 2:00 p.m. on June 26, 2009 and EOT test on June 29, 2009 before leaving Roanoke.

As the train approached the accident area, the engineer was operating from the leading locomotive, NS 9784. The conductor was also on the leading locomotive. The engineer and conductor both stated the trip was uneventful up until the time of the accident. The engineer was sounding the bell and horn for maintenance-of-way employees just prior to approaching the highway/rail grade crossing at Garman Road. The train was being operated at 43 mph approaching the accident area with the maximum authorized timetable speed for this territory being 45 MPH.

The track in this area is tangent for more than 2 miles with +0.71% ascending grade for 2000 feet approaching the crossing. Line of sight is not normally obstructed approaching the crossing. On this day however, a work train was standing in the center siding east of the crossing and three track welding trucks were on number one track at the crossing. Timetable and geographical direction of the train was westward. Timetable directions will be used in this report.

The Maintenance of Way Department had called a signal maintainer to the crossing to properly disable the train detection circuitry of the crossing warning system for number one track. The track welders were to be working on the number 1 track in the approach to the crossing all day which would have constantly triggered

the detection circuitry. The maintainer first tried to apply a shunt across the rails in the approach to the crossing to disable the detection, but was unsuccessful because one of the track welder trucks occupied the island circuit of the crossing. The maintainer then went into the signal relay house to disable the detection at the detection unit. While he was working at this, the assistant track foreman who was responsible for the on-track safety of the track welders arrived at the crossing. The assistant foreman asked the maintainer if he was close to being finished, and the maintainer replied that he almost had the detection circuit disabled. The assistant foreman said there was a truck coming and he was going to go allow him to cross the tracks. The assistant track foreman went to the crossing gate and manually lifted the gate and waved to the truck driver to proceed across the tracks. The assistant track foreman could not see the train approaching from the east due to the three track welder trucks on number one track and work train in the center siding east of Garman Road.

The tractor-trailer was being driven from the south in a northward direction at 15 mph. The speed limit on Garman road is 25 mph. As the driver approached the crossing, the assistant track foreman physically raised the crossing gate and waved to the truck driver to proceed across the crossing. The truck driver could not see the train approaching on number 2 track east of the crossing due to the three track welder trucks that were stationary on number one track and along with the work train in the center siding. When the truck was approximately halfway across the railroad tracks, the truck driver saw the approaching train on number two track and attempted to accelerate to clear the tracks before the train reached the crossing.

The Accident

Train number 771V428 was traveling west bound on number two track at 43 mph as it approached the highway rail grade crossing. When the collision occurred the train impacted the trailer portion of the highway vehicle. The engineer attempted to place the consist into emergency braking two seconds before impacting the trailer thus reducing the train's speed from 43 to 40 mph at the time of the impact. Both speeds were recorded by the event recorder on the leading locomotive. Maximum authorized speed at this location for this type of train as designated by the NS Timetable is 45 mph.

The train crew could not see vehicles approaching the track from the south on Garman Road due to the work train standing in the center siding and multiple track welder vehicles parked on number one track east of the road crossing. They were able to see the crossing warning system (gates, lights, bells) on the north side of the tracks were working properly, with the gate in the horizontal position and lights flashing. The rail view camera on the locomotive showed the top of the trailer was visible four seconds before impact.

When the train had stopped, the engineer notified the dispatcher that they had hit a vehicle at Garman Road crossing. The conductor left the locomotive to walk the train, check for injury to the truck driver, and assess any damage. He found that the only damage was to the lead locomotive. The train had impacted the trailer approximately four feet behind the tractor, passing through the trailer.

An Assistant Trainmaster was assigned to investigate the accident for NS during which he downloaded and collected the data from the event recorder of the lead NS unit, the download from the rail view camera, and obtained statements from the train crew and other employees present when the accident occurred.

The Roanoke County Police also investigated the accident. They did not obtain a statement from the truck driver. FRA Region 2 made several attempts to contact the truck driver, but was unsuccessful.

The wreckage of the trailer was removed from the track by a local salvage company and the track, signal system and crossing warning system were all tested and inspected by NS personnel and were all found to be in proper working order. Tests of the crossing warning system showed it was working properly. The damaged lead locomotive was set out from train number 771V428. The train was then re-crewed and allowed to continue to Bluefield, West Virginia.

Analysis and Conclusion

Analysis-Toxicology Testing: NS performed toxicological tests on the assistant track foreman who raised the crossing gate for the truck to cross the track the tracks. The results were negative. There were no toxicological tests performed on the train crew or the truck driver. The FRA does not require testing for this type of accident.

Conclusions: Intoxication was not a factor in this accident.

Analysis: Highway-Rail Grade Crossing: The highway-rail grade crossing is equipped with active warning devices consisting of lights, gates and bells. There are advanced warning signs and pavement markings 200 feet from the crossing. The crossing surface is in good condition.

The railroad has a whistle post 1500 feet east of the crossing and the engineer stated he began sounding the horn when the train approached the post. This was verified by the "Rail-view-recorder" on the locomotive and the event recorder of the locomotive.

The crossing warning devices were active prior to the accident due to track work on the adjacent track. Three trucks were on the rail east of Garman Road and two were on the rail west of Garman Road. These trucks obstructed the view of traffic approaching the tracks from the south. The assistant track foreman raised the gate and waved to an oncoming truck to proceed across the tracks without first verifying there was no train traffic approaching the crossing. He failed to determine it was safe for the truck to proceed across the tracks before waving to the driver to proceed across the tracks into the path of the oncoming train.

The active warning devices were tested at the time of the accident by the signal maintainer, and were found to be functioning as intended. The tests were performed again at 8 a.m. the next day in my presence.

Conclusion: The assistant track foreman did not make certain the way was safe before disabling the active warning devices, and waving the truck across the tracks into the path of the oncoming train. His actions resulted in the impact between the train and the tractor-trailer.

Analysis-Locomotive Safety Devices: The lead locomotive was equipped with a head light, auxiliary lights, and the audible warning device required by Title 49 of the Code of Federal Regulations. The locomotive engineer tested these devices before leaving the terminal the morning of the accident and again in the presence of the assistant trainmaster immediately after the accident, and they functioned as intended.

Conclusion: The locomotive safety devices were in compliance with Federal requirements.

Analysis-Locomotive Engineer Operating Performance: The locomotive was equipped with a event and speed recorder as required. It was also equipped with a "Rail-view-recorder" system. The recorder data was downloaded by the assistant trainmaster at the accident site and analyzed at Roanoke.

Conclusion: The locomotive engineer was in compliance with all applicable railroad operating and train handling requirements.

Analysis-Fatigue: FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to a blood alcohol content of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. FRA obtained fatigue related information, including 10 days work history, for the two man train crew and the assistant track foreman involved in this accident.

Conclusion: Fatigue was not evident for any employee involved with this accident.

Overall Conclusions: The train crew was in compliance with NS and FRA regulations. The locomotive safety devices were in compliance with Federal requirements. The crossing warning system was operating as intended. The actions of the signal maintainer were in compliance with NS and FRA regulations. The assistant track foreman failed to follow NS rules and procedure and FRA regulations by disabling the active warning system, raising the crossing gate and telling the truck driver to proceed across the tracks without making sure it was safe for him to do so.

Probable Cause & Contributing Factors: The FRA conclude that this accident occurred because the assistant track foreman interfered with the operation of the active crossing warning devices without providing for the safety of employees or the motoring public. The track welder's trucks on the adjacent track blocking the truck driver's line of sight toward the approaching train was a contributing factor to the accident.