Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-42

Norfolk Southern
Lemoyne, AL
June 1, 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-2006-42

1.Name of Railroad Operating Train #1: Norfolk Southern Corp. [NS]	1a. Alphabetic Code: NS	1b. Railroad Accident/Incident No.: 25365
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.: 25365
4. U.S. DOT_AAR Grade Crossing Identification Number: 727807V	5. Date of Accident/Incident: Month 06 / Day 01 / Year 2006	6. Time of Accident/Incident: 11:40: ☑ 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): **07**

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
14	7	0	0	Alabama

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Axis	128.2MB	N/A	AL	MOBILE

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
90 F		2		1		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		4	6.3		2

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 — Code: 1

27. Train Number/Symbol: A89A40 1

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

29. Trailing Tons (gross tonnage, excluding power units): 955

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): j 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	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	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	8	0	2	0	0
(2) Total Derailed	3	0	2	0	0

36. Equipment Damage — This Consist: 36600

37. Track, Signal, Way, & Structure Damage: 8000

38. Primary Cause Code: M308

39. Contributing Cause Code: N/A

Number of Crew Members

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

Length of Time on Duty

44. Engineer/Operator: Hrs 3 Mi 40

45. Conductor: Hrs 3 Mi 40

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	1

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: 6

53. Was Equipment Attended? 1. Yes 2. No — Code: 2

54. Train Number/Symbol: N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated: 0 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			j 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)	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)	SHPX2 20898	1	no		N/A	N/A
(2) Causing (if mechanical cause reported)	0	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	62. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	0	0	0	0	(1) Total in Equipment Consist	0	0	7	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	2	0	0

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
17800	0	M308	N/A

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

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 | N/A

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

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

Highway User Involved

79. Type — Code: C
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): 2

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

82. Position — Code: 3
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: 3
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

83. Equipment — Code: 1
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: 1

85. Circumstance — Code: 1
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.
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)	03	06	07	N/A	N/A	N/A	N/A

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

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

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

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

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

93. Driver's Age: 60

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

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

96. Driver — Code: 2
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: 2
1. Yes 2. No 3. Unknown

98. View of Track Obscured by (primary obstruction) — Code: 8
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	1

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

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

102. Highway Vehicle Property Damage (est. dollar damage): 1200 00

103. Total Number of Highway-Rail Crossing Users (include driver): 1

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

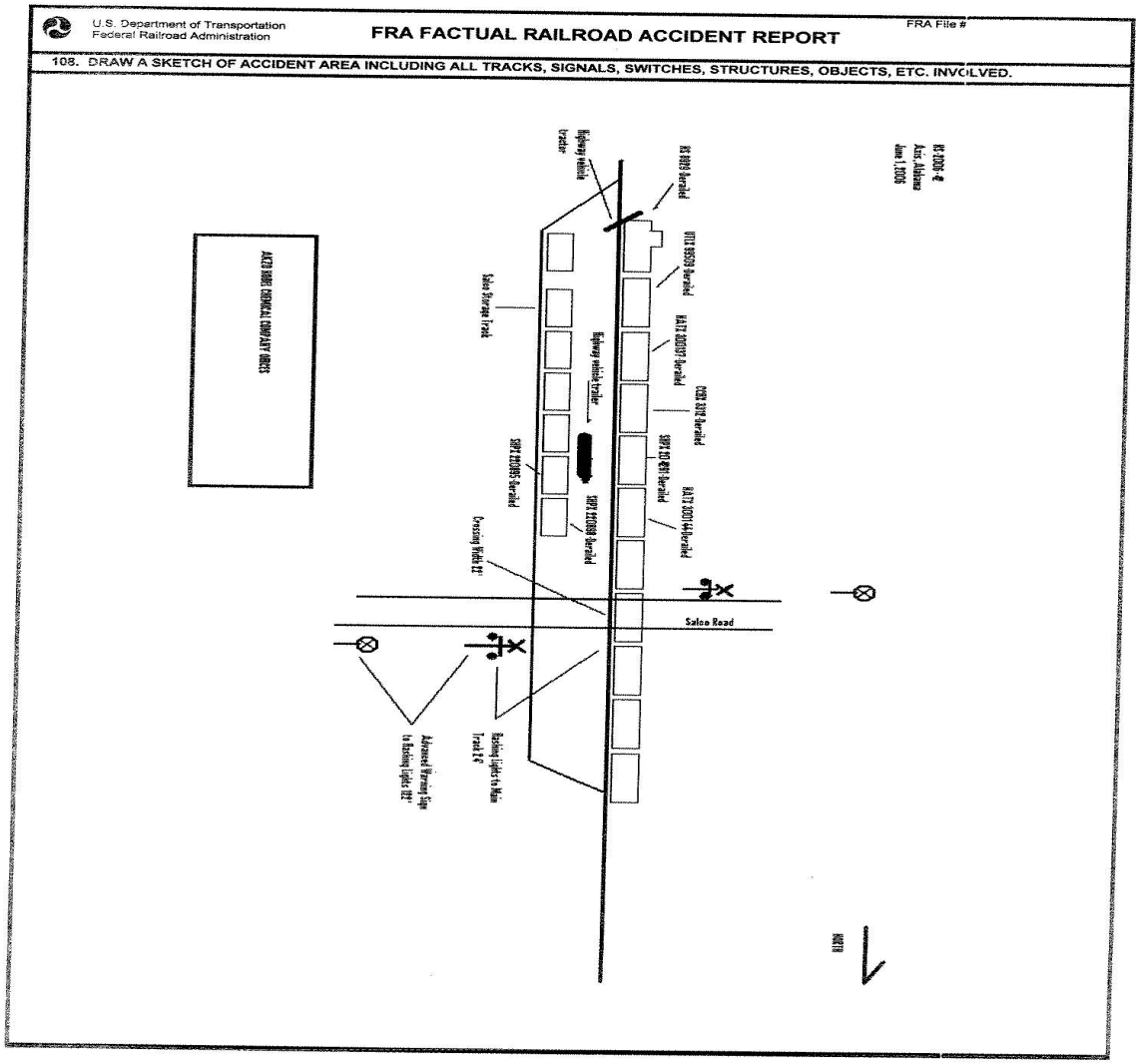
105. Locomotive Auxiliary Lights Operational? — Code: 1
1. Yes 2. No

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

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

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

HQ-2006-
42
sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

On June 1, 2006, at 11:40 a.m. Central Daylight Time (CDT), southbound Norfolk Southern Railway (NS) freight Train A89A401 struck a westbound tractor-trailer (tanker) at a public highway-rail grade crossing in Axis, Alabama (AL). The accident occurred at milepost (MP) 128.2MB on the 3-B South Subdivision of the NS Alabama Division. The method of operation in the accident area is Track Warrant Control.

The impact derailed the locomotive and the first through fifth head cars on the train and two rail cars standing in an adjacent storage track. All derailed cars contained hazardous materials, but no cars were breached and there was no release of materials.

The tractor separated from the trailer on impact. The tractor wrapped around the front of the locomotive and became lodged under the front snowplow and end sheet. The trailer was shoved to the east side of the main track and dragged about 200 feet before becoming wedged between the train and cars standing in the Salco Storage Track. The trailer contained Sulfuric Acid, but there was no puncture of the tank and no release of product. The impact ripped the fuel tanks from the tractor resulting in a fire that consumed the tractor and burned the west side of the locomotive. The fire was quickly extinguished by local fire personnel. There were no evacuations of nearby businesses or residents.

The train crew and tractor driver received minor injuries and were taken to local hospitals where they were treated and released.

Estimated track damage is $8,000 and equipment damage is $53,800. The tractor-trailer was destroyed at an estimated replacement cost of $80,000 for the tractor and $40,000 for the trailer.

At the time of the accident, the weather was clear with a temperature of 90°F.

The accident was caused by the failure of the truck driver to stop clear of the crossing and yield the right-of-way to the approaching train.

110. NARRATIVE

Circumstances Prior to the Accident

The crew of NS Train A89A401 consisted of a locomotive engineer, conductor, and brakeman. All crew members went on duty at 8 a.m., CDT, June 1, 2006, at the NS Mobile Yard in Mobile, AL. Mobile is the home terminal for all crew members, and all members received more than the statutory off duty period prior to reporting for duty.

NS Train A89A401 consisted of lead and controlling locomotive NS 8929, three loaded cars of mixed freight, and 18 empty cars. It was 1,260 feet long and weighed 770 tons. Train A89A401 is a local road switcher scheduled to work various industries between North Mobile Yard, MP 146.0MB, and Lemoyne, AL, MP 128.9MB, and return. The train received a Class I air brake test by NS mechanical personnel and departed North Mobile Yard at 8:53 a.m.

Train A89A401 had just finished servicing U. S. Amines Industry, MP 127.0MB, and was heading south to the Lemoyne Storage Track, MP 129.0MB. Approaching the accident area, the locomotive engineer was seated at the controls on the west side of the locomotive, the conductor and brakeman were seated on the east side.

This area of the railroad is tangent for two miles to the point of the accident and two miles beyond. Salco Road is tangent with the grade practically level.

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

The Accident

NS Train A89A401

NS Train A89A401 was operating cab forward at the authorized speed of 37 miles per hour (mph) as it approached the Salco Road crossing. The engineer began sounding the locomotive horn at the whistle board and all train crew members said the view of the crossing was unobstructed. The engineer, conductor, and brakeman observed the tractor-trailer slowly approach the crossing from the east side. The brakeman said the tractor-trailer stopped on the storage track, clear of the main track, then started easing over the crossing. When the train was about 150 feet north of the crossing, the engineer realized the tractor-trailer was not going to stop. He made an emergency air brake application and continued sounding the locomotive horn until about 75 feet before impact.

The tractor-trailer was struck on the right side, between the tractor cab and trailer. The fuel tank on the tractor exploded on impact consuming the tractor and engulfing the west side of the locomotive. The tractor wrapped around the front snowplow and end sheet of the locomotive and was carried south, in front of the train, about 555 feet until the train stopped. The trailer broke away from the tractor and was dragged about 200 feet between the Salco Storage Track and the east side of the train, resulting in the derailment of the two north cars in the storage track.

The train was operating at 37 mph when the collision occurred. The speed was recorded by the event recorder on Locomotive NS 8929. The maximum authorized speed in the accident area is 49 mph, as designated in the current NS Alabama Division Timetable No. 15.

After the train stopped, the engineer's side window and door were engulfed in flames. The conductor attempted to open the door in the nose of the locomotive, but it would not open more than six inches. The brakeman, conductor, and engineer jumped out the window on the east side of the locomotive. The conductor went to the front of the locomotive and helped the driver out of the burning tractor cab. The train crew and driver walked/ran to a private crossing, U. S. Fibers, about 75 yards south of the stopped train. The conductor used his cell phone to call the NS Chief Dispatcher and the 3-B South Operations Manager. The engineer called 911 from his cell phone and the locomotive radio before he jumped from the locomotive window.

Two NS mechanical employees arrived on the scene about 12:10 p.m., followed by the Creola, AL Police Chief and the Saraland, AL Emergency Medical Services (EMS). Units from the Saraland, Mobile, and U. S. Amines Industry Fire Departments arrived shortly thereafter and extinguished the fires on the tractor, locomotive, and along the west side of the NS right-of-way. The NS operations manager and assistant operations manager arrived on the scene at 12:30 p.m. as the train crew was being placed in the ambulance. The EMS transported all train crew members to the Springhill Medical Center in Mobile and the vehicle driver to the USA Hospital in Mobile. The Creola Police Chief took statements from the vehicle driver and train crew, but did not file a report because the accident was not within his jurisdiction. An AL Highway Patrol Officer arrived on the scene, but did not make a report because according to the officer, it was a private crossing.

Highway Vehicle

The motor vehicle was a 2006 tractor-trailer owned by Penske Leasing, Inc. and leased by American Road Lines, Moon Township, Pennsylvania. It was driven by a 60 year-old male who had just departed Akzo Nobel Chemical after obtaining a load of Sulfuric Acid. The tractor-trailer was traveling west on Salco Road, which runs east to west between Akzo Nobel Chemical and U. S. Highway 43. The driver said he saw the crossing lights flashing and stopped, but he did not see the train. He thought the crossing lights were malfunctioning and began driving over the crossing at an estimated speed of 2 mph.

Description of the Accident Site

The NS railroad approaching the Salco Road crossing consists of a single main track extending north and south. A storage track, Salco Storage, located east of the main track also crosses Salco Road. The main track is tangent for about two miles north of the crossing and a considerable distance beyond. There is a 0.04-percent ascending grade approaching the crossing. Southbound trains approaching the crossing have an unobstructed view.

Salco Road is a two-lane asphalt road that extends east to west from Akzo Nobel Chemical to U. S. Highway 43, crossing the NS railroad at a 90-degree angle. The crossing is rubber and asphalt 32 feet in length by 22 feet in width. NS records show the crossing as private, but the Alabama Mobile County Public Works Department and the Federal Railroad Administration (FRA) list the crossing as public.

The crossing is equipped with standard flashing lights, audible bell, crossbucks, and advanced warning signs on both sides of the crossing. The advanced warning sign for westbound vehicle traffic is located about 122 feet from the flashing light mast, and the flashing light mast is located about 24 feet from the main track. There are no pavement markings approaching the crossing. The sight distance for westbound vehicle traffic looking north is about 2,000 feet. The sight distance looking south is restricted when cars are in the siding, but the NS has marked the rail so cars are not placed closer than 100 feet south of the crossing, which improves visibility.

Analysis and Conclusions

Analysis

Whistle board signs were displayed in both directions approaching the crossing. The engineer said he began sounding the locomotive horn near the whistle board and continued to sound it until about 75 feet from impact. Two witnesses employed by Akzo Nobel Chemical said the train horn was being sounded prior to the collision. One of the witnesses also said she observed the crossing lights flashing and heard the crossing bells ringing prior to the collision.

Locomotive NS 8929 derailed and sustained damage to the front snowplow, end sheet, left and right handrails and steps, uncoupling lever, MU cable, continuous barrier, ditch lights, and headlights. The west side of the locomotive also sustained fire and smoke damage. The locomotive was equipped with headlights, auxiliary lights, and an audible warning device as required by 49 CFR Part 229, Railroad Locomotive Safety Standards. All devices were working as intended prior to the collision.

The five head cars behind the locomotive derailed, but remained upright. Each of the cars sustained varying degrees of damage. The two north cars in the Salco Storage Track derailed and sustained damage.

The highway vehicle was destroyed. The tractor was consumed by fire and the trailer was damaged to the extent that it could not be repaired.

The active warning devices at the crossing were inspected and tested by a NS Signal Maintainer at the time of the accident. The crossing signals were also inspected and tested by an FRA Signal and Train Control Inspector the day following the accident. No defects were noted during either of the inspections and tests, and all devices operated as intended.

No toxicological tests were performed on members of the train crew or the vehicle driver. No city, county, or state law enforcement agencies formally investigated and filed an accident investigation report.

Probable Cause

The FRA concluded that the probable cause of the accident was the failure of the motor vehicle driver to stop clear of the crossing and yield the right-of-way to the approaching train.

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