Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2010-23

Amtrak (ATK)
University Park, IL
April 16, 2010

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-2010-23

1.Name of Railroad Operating Train #1: Amtrak [ATK]	1a. Alphabetic Code: ATK	1b. Railroad Accident/Incident No.: 115471
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: Canadian National - North America [CN]	4a. Alphabetic Code: CN	4b. Railroad Accident/Incident No.: 667641

5. U.S. DOT_AAR Grade Crossing Identification Number: 289680Y	6. Date of Accident/Incident: Month 04 Day 16 Year 2010	7. Time of Accident/Incident: 09:35:00 ☐ AM ☑ PM

8. 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)* — Code: 07

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
0	N/A	N/A	0	Chicago

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
University Park	31.4	IL	17	WILL

18. Temperature (F) *(specify if minus)*	19. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
54 F	4	1	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density *(gross tons in millions)*	25. Time Table Direction 1. North 2. South 3. East 4. West — Code
Main Track No. 1	4	34	1

OPERATING TRAIN #1

26. 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	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
2	1	ATK 392

29. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	30. Trailing Tons *(gross tonnage, excluding power units)*
78 MPH R	N/A

31. 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

31a. 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

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	Amtrak 199	1	N/A
(2) Causing *(if mechanical cause reported)*	N/A	0	N/A

33. 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

34. Was this consist transporting passengers? (Y/N): Y

35. 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	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	4	0	0	0
(2) Total Derailed	0	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$0.00	$100.00	M307	H994

Number of Crew Members: 41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	1

Length of Time on Duty: 45. Engineer/Operator	46. Conductor
Hrs 5 Mi 5	Hrs 5 Mi 5

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	0

50. EOT Device? 1. Yes 2. No — 2

51. Was EOT Device Properly Armed? 1. Yes 2. No — N/A

52. Caboose Occupied by Crew? 1. Yes 2. No — 2

OPERATING TRAIN #2

53. 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	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

56. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	58. Method(s) of Operation *(enter code(s) that apply)*
0 MPH N/A	a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

58a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2010-23

57. Trailing Tons *(gross tonnage, excluding power units)* 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 *(Specify in narrative)* Code(s): N/A N/A N/A N/A N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

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

60. 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

61. Was this consist transporting passengers? (Y/N) N/A

62. 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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	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

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
0	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 0 Mi 0

73. Conductor: Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

77. EOT Device? 1. Yes 2. No N/A

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

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

OPERATING TRAIN #3

80. 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

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

82. Train Number/Symbol: N/A

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

84. Trailing Tons *(gross tonnage, excluding power units)* N/A

85. 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): N/A N/A N/A N/A N/A

85a. 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: N/A

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

87. 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

88. Was this consist transporting passengers? (Y/N) N/A

89. 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	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(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

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

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

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
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

104. EOT 1. Yes 2. No N/A

105. Was EOT Device Properly 1. Yes 2. No N/A

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

Highway User Involved

107. Code: 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)*

108. Vehicle Speed *(est. MPH at impact)*: 2

109. *geographical)* Code: 4
1.North 2.South 3.East 4.West

Rail Equipment Involved

111. 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)*

112. Position of Car Unit in: 1

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2010-23

110. Position	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	3	1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	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	4	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	4

114c. State here the name and quantity of the hazardous materials released, if any.
N/A

115. Type 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	116. Signaled Crossing *(See instructions for codes)* Code	117. Whistle Ban 1. Yes 2. No 3. Unknown Code
Code(s)	01	03	06	07	01	2

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code
	1		2		2

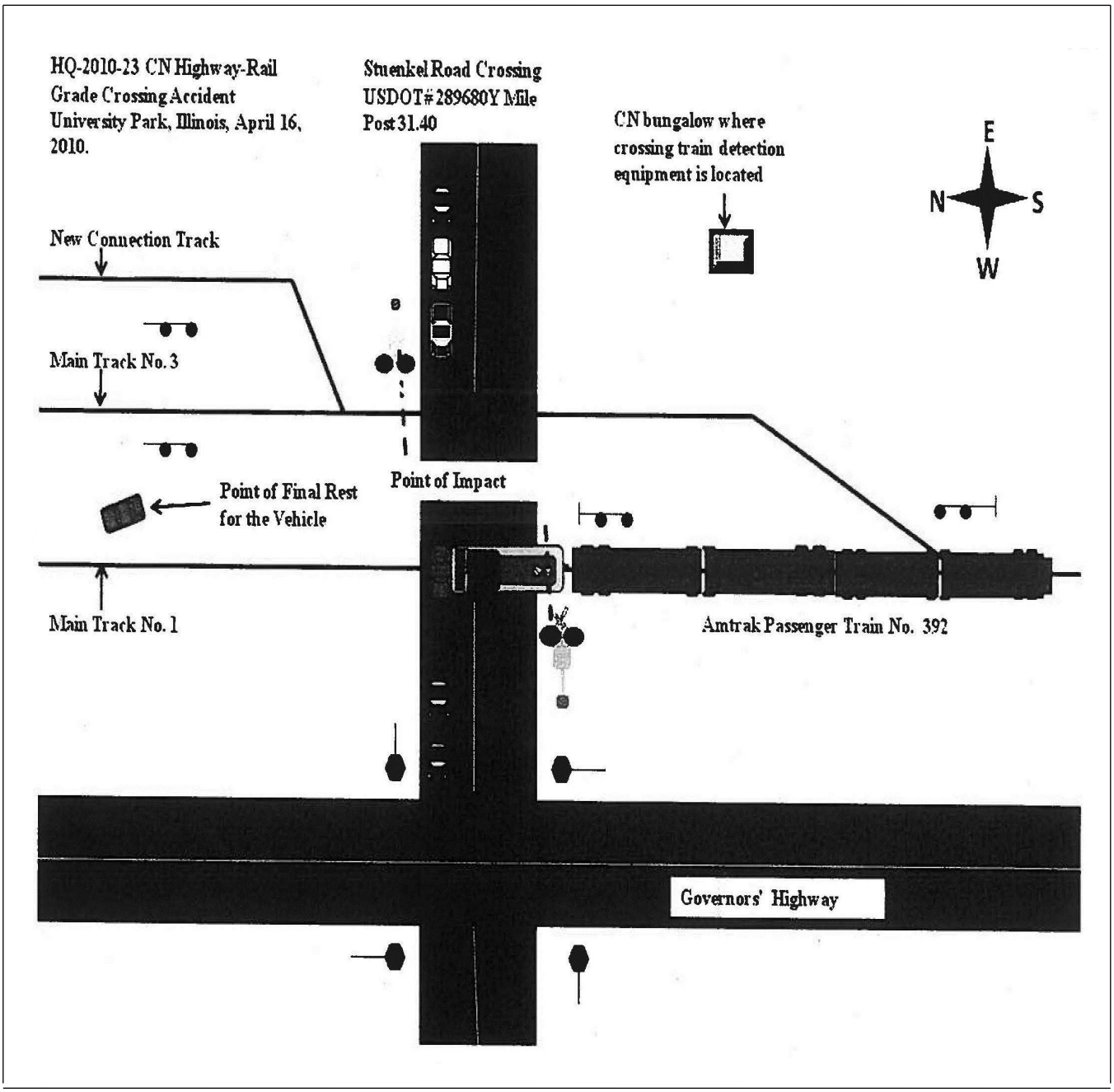
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)*	Code
26		2		2		3

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code	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		8

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				1		1
129. Highway-Rail Crossing Users	0	0	130. Highway Vehicle Property Damage *(est. dollar damage)*	9000	131. Total Number of Highway-Rail Crossing Users *(include driver)*	1

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code
	1		1
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code
	1		1

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



137. SYNOPSIS OF THE ACCIDENT

SYNOPSIS

On April 16, 2010, at 9:35 p.m., c.d.t., National Railroad Passenger Corporation (Amtrak) Train 392 (Amtrak 392) collided with a westbound automobile at a highway-rail grade crossing. Amtrak 392 was operating northbound over Canadian National-North America's (CN) Chicago Division, Chicago Subdivision, on Main Track No. 1. The accident occurred in University Park, Illinois, at Stuenkel Road, DOT 289680Y.

The driver of the automobile was killed. The automobile was destroyed. There were no injuries to the train crew or Amtrak passengers, no fire, and no release of hazardous materials. Amtrak 392 sustained no damage and there was no derailment or track damage. There was $100 damage to signal equipment. At the time of the accident it was dark, the weather was clear, and the temperature was 54 °F.

Probable cause:

The probable cause of the accident was warning time of less than 20 seconds, attributed to the signal system's failure to de-energize the warning system control circuit while ATK 392 was on the approach circuit.

Contributing causes:

The first contributing cause of the accident was Stuenkel Road's highway-rail grade crossing warning system was placed in-service without completion of required testing to determine that the warning system and its component parts were in a condition to perform their intended function.

A second contributing cause of the accident was CN's signal personnel's failure to comply with Federal regulations and CN rules, policies, and procedures.

138. NARRATIVE

110. CIRCUMSTANCES PRIOR TO THE ACCIDENT

The current U.S. DOT Crossing Inventory Information data sheet indicates Stuenkel Road was renamed University Parkway, effective September 6, 2009. Local authorities and the railroads still refer to University Parkway as Stuenkel Road. Stuenkel Road will be used in this report.

The crew of Amtrak 392 included a locomotive engineer, conductor, and assistant conductor. The crew went on duty at 4:30 p.m., April 16, 2010, at Amtrak's Carbondale Terminal in Carbondale, Illinois. Carbondale is the home terminal for all crew members and all received more than the statutory off-duty period of ten hours prior to reporting for duty. The locomotive engineer received twenty five hours and fifty four minutes off-duty time. The conductor received twenty five hours and forty four minutes off-duty time. The assistant conductor received thirty eight hours and six minutes off-duty time.

Amtrak 392 consisted of one locomotive, one business class cafe car, and three coach cars. Amtrak 392 was scheduled to operate from Carbondale to Chicago, Illinois, with nine intermediate stops. Amtrak 392 was not equipped with an end of train device. The locomotive daily inspection form located in Amtrak's Lead Locomotive 199 (Locomotive 199), indicated the daily inspection was performed at 1 a.m. on April 16, 2010, in Chicago. The F6180.49 cab car record indicated the 92 day periodic inspection was performed on January 15, 2010, at Amtrak's 16th Street diesel shop in Chicago. The record also indicated a 368 day inspection was performed on October 7, 2009, at Amtrak's 16th Street diesel shop.

The morning of April 16, 2010, Amtrak 392 received a Class II brake test and shortly thereafter departed Carbondale. Locomotive 199 was operating with the short hood forward.

On April 14, 2010, CN signal and track personnel initiated track, signal and highway-rail grade crossing warning system changes at CN's Control Point (CP) Stuenkel and Stuenkel Road highway rail grade crossing.

On April 16, 2010, at 9:43 a.m., the signal supervisor instructed the local signal maintainer to place a 529A--a

Stop & Flag Order--on Stuenkel Road for the track and signal personnel who were going to work on Main Track No. 1. The signal maintainer called the dispatcher and determined a 529A was already in place and had been since 7:27 a.m. April 14.

On April 16, 2010, the signal crew flagmen were released sometime during the track & signal work and the local signal forces protected the highway-rail grade crossing for train movements. The track and signal work was completed that afternoon. The signal personnel then conducted shunt testing to determine the train detection circuits would detect to a .06 ohm shunt. They failed to verify that the highway-rail grade crossing warning system would activate for each train detection circuit shunted. The highway-rail grade crossing warning system was then placed in-service on April 16, 2010, at 6:30 p.m., as testing of the warning system had been completed.

There were two CN signal personnel at Stuenkel Road at the time of the accident, a signal inspector and a signal supervisor. The signal inspector went on duty April 16, 2010, at 11:30 a.m. Prior to reporting for duty the signal inspector received the required statutory off-duty time, required by FRA's Hours of Service Act (HOS). The signal inspector received ten hours and 30 minutes off-duty time. The signal supervisor was not performing HOS covered service during the in-service testing.

Just prior to the accident, the signal supervisor was outside of the control bungalow observing Amtrak 392's approach and the signal inspector was inside the control bungalow observing the Safetran Grade Crossing Predictor (GCP) 4000 train detection units.

CN Main Track No. 1 is tangent on both sides of Stuenkel Road for a distance of one half mile. Approaching from the south, there is a 0 degree to + .44 degree ascending grade for the area south of Stuenkel Road. Traveling east to west on Stuenkel Road, the grade is practically level. Approximately 150 feet west of the accident site Stuenkel Road crosses Governors Highway. The intersection is equipped with four way stop signs and a flashing red light. The timetable direction and geographic direction of Amtrak 392 was north. Timetable directions will be used this report.

The 2006 Jeep Liberty was traveling from east to west on Stuenkel Road. The automobile was driven by a 26 year old female and she was the only occupant in the automobile.

At the time of the accident, the locomotive engineer was seated at the control stand on the east side of the locomotive. The conductor and assistant conductor were in the rear coach car.

The Accident:

Amtrak 392
Amtrak 392 was being operated at a speed of 78 mph (maximum authorized speed is 79 mph)as it approached Stuenkel Road. The locomotive engineer saw automobiles traversing Stuenkel Road in a west direction as he was sounding the train horn on approach to Stuenkel Road. He saw an automobile traveling in a west direction proceed in front of his train. The locomotive engineer made an emergency application of the train air brake system just prior to striking the automobile.

As Amtrak 392 approached Stuenkel Road, the signal supervisor saw the warning system was not operating as it should and attempted to contact the signal inspector to activate the highway-rail grade crossing warning system. He then ran towards the crossing to warn the highway users. The signal inspector did not have time to activate the highway-rail grade crossing warning devices,and the highway-rail grade crossing warning system detected Amtrak 392 approximately two seconds before impact with the automobile.

Amtrak 392 struck the left side of the automobile in the front passenger door. The automobile came to rest approximately 250 feet north of Stuenkel Road, between Main Track No. 1 and Main Track No. 3. Amtrak 392 came to a stop approximately 2,330 feet north of the crossing.

The locomotive engineer notified the CN Rail Traffic Control train dispatcher by radio. The train dispatcher notified the University Park Police and Fire Department and their Emergency Medical Services. The emergency responders checked the driver of the automobile for signs of life. The driver of the automobile was pronounced deceased at the accident scene.

The signal supervisor contacted the train dispatcher and his signal manager and advised them of the accident. He then sealed the highway-rail grade crossing warning system control bungalow to prevent entry until CN management arrived at the scene. When CN senior S&C management arrived, testing was conducted to determine the cause of the highway-rail grade crossing warning system's failure to provide a minimum of 20 seconds warning time.

The Federal Railroad Administration (FRA) was not notified of the accident until Saturday, April 17, 2010. A FRA signal and train control (S&TC) safety inspector was dispatched to investigate the incident. CN had corrected the programming error in the GCP 4000 unit.

FRA and Illinois Commerce Commission (ICC) Signal and Train Control (S&TC) safety inspectors initiated an investigation into the accident on Monday, April 19, 2010. FRA and ICC operating practices safety inspectors participated in the investigation.

Analysis and Conclusions:

Analysis-Toxicological Testing Train Crew:
This accident did not meet the criteria for 49 CFR part 219, subpart C - Post Accident Toxicological Testing.

Conclusion: CN and Amtrak elected not to test under their post accident toxicological testing authority, since it also failed to meet their prescribed testing criteria.

Analysis -Toxicological Testing Automobile Driver:
Toxicological testing was not performed on the automobile driver.

Analysis - Highway-Rail Grade Crossing Preview and Condition:
The active and passive warning devices at Stuenkel Road highway-rail grade crossing consist of two gate mechanisms, two electronic bells, and two cross buck signs mounted on masts. Also on the masts are mounted twelve inch, back to back flashing light emitting diode (LED) units. The advance warning sign for westbound vehicle travel is posted 241 feet east of the railroad crossing on Stuenkel Road. The westbound pavement markings are not clearly distinguishable. The preview of the tracks is not obstructed at the railroad crossing stop bars. Stuenkel Road is maintained by the University Park Street Department. The track structure is maintained by CN.

CN has a whistle post approximately 1,420 feet south of Stuenkel Road highway-rail grade crossing. Data from the Amtrak locomotive event recorder and onboard video validated the locomotive engineer began sounding the train horn as Amtrak 392 neared the whistle post.

The Stuenkel Road crossing warning system was returned to service at 6:30 p.m. on April 16, 2010, after track and signal personnel completed work on CN's Main Track No. 1. The highway-rail grade crossing warning system did not provide advance warning to highway users at Stuenkel Road before Amtrak 392 entered the highway-rail grade crossing. The cause of the activation failure was a disabled AND XR 1 programming parameter on GCP 4000 unit number one. Both CN's and FRA's investigations were unable to determined the exact time the AND XR 1 programming parameter was disabled. With the AND XR 1 programming parameter disabled on GCP 4000 unit number one, GCP 4000 unit number one did not activate the highway-rail grade crossing warning system until Amtrak 392 entered the Stuenkel Road crossing.

Conclusion: The highway-rail grade crossing warning system failed to detect Amtrak 392 in time to provide a minimum of 20 second warning time to highway users.

Automobile Driver:

Illinois State Statue 625 5/11-1425 prohibits drivers from traversing any railroad crossing unless there is sufficient space on the other side to accommodate the vehicle they are operating without obstructing the passage of other vehicles...University Park Police interviews with witnesses indicate the driver of the automobile had entered the Stuenkel Road highway-rail grade crossing and was trying to clear Main Track No. 1 at the time of the accident, but was unable to do so because of a traffic back-up from the Governors Highway intersection.

Analysis - Locomotive Safety Devices: Locomotive 199 was equipped with a headlight, auxiliary lights and the audible warning device required by Federal regulations. The University Park Police Department Vehicle/Train Collision Supplement Report shows the horn, bell, sanders and lights were found to be working as intended after the accident.

The event recorder data from Locomotive 199 confirmed the speed, 78 mph, of Amtrak 392. The event recorder data also indicated all safety devices on Locomotive 199 were functioning as intended.

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

Analysis - Locomotive Engineer Operating Performance: Amtrak 392 was equipped with a speed indicator and an event recorder as required. The relevant event recorder data was downloaded by Amtrak supervision at Chicago Union Station and analyzed. No exceptions to the locomotive engineer's operating performance were identified.

On April 21, 2010, FRA and ICC operating practices safety inspectors in the presence of an Amtrak Road Foreman reviewed the digital images of the right of way imaging system (camera) mounted in Amtrak Locomotive 199. No exceptions to the locomotive engineer's operating performance were identified.

Locomotive 199's on board video camera shows the highway-rail grade crossing warning system did not provide 20 seconds warning time prior to the accident and indicates the locomotive engineer was sounding the train horn as Amtrak 392 approached the crossing. The event recorder data from Locomotive 199 indicates the sounding of the locomotive horn was initiated approximately 15 seconds prior to the accident.

An FRA Chief Inspector also analyzed the relevant event recorder data and took no exceptions to the performance of the locomotive engineer.

Conclusion: The locomotive engineer was in compliance with all applicable railroad and Federal rules and regulations.

Analysis - Fatigue: FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At or above this baseline, FRA does not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings.

FRA obtained fatigue related information, including a 10-day work history, for the three crew members of Amtrak 392 and the signal inspector involved in the accident.

Conclusion: FRA concluded fatigue was not probable for any of the train crew of ATK 392 or the signal inspector.

Analysis – CN S&C employee's compliance with CN rules, practices and procedures: FRA's investigation determined CN S&C employees involved in the in-service testing at Stuenkel Road highway-rail grade crossing did not comply with multiple CN rules, practices and procedures. (See below)

CN Signal and Communication (S&C) Codes of Practice (SCP)-709 – Procedures to be followed by S&C Employees in the Deactivation of Road Crossing Warning Systems; SCP-1201 – Service Testing of S&C Equipment and Materials; SCP-1209-1 – Testing Certification Form; SCP-1210-1 – Roadway Crossing Warning System (RCWS) – Safety Assurance Process Check List; SCP-12-10-3 – Installation Safety Assurance Check List; SCP-1210-8 – RCWS Wiring Certification Form; and SCP-1250-1 – S&C Inspection Audit Form for Road Crossing Warning Systems.

CN General Instructions (GI) 301-(h) Inspection and Test Intervals; GI-301 (i) – Protecting Train Operations During Signal System Interruptions; GI-301 (k) – Recording Inspection and Test Results;
GI-301 (m) – Other Instructions; GI-301 (p) – Observance of Rules, Standards and Instructions; GI-301 (r) – Hours of Service Act; GI-335 – Inspecting and Testing Vital Electronic Equipment; GI-335 (a) – Inspecting and

Testing Vital Electronic Equipment, Continued; and GI-335 (b) – Inspecting and Testing Vital Electronic Equipment, Continued.

On April 20, 2010, FRA requested a copy of the FRA required signal tests and inspections for Stuenkel Road. CN failed to provide FRA with electronic documentation indicating which required Federal and railroad tests and inspections were completed during the in-service testing at Stuenkel Road prior to the accident. CN informed FRA the hand held electronic devices used by CN to record tests and inspections were not available to the signal personnel performing in-service tests and inspections at Stuenkel Road. CN did provide FRA with copies of the FRA required signal tests and inspections performed after the highway-rail grade crossing was placed in-service on April 24, 2010.

Conclusion: The failure of CN employees to comply with CN rules and instructions may have been a contributing factor to the events leading up to the activation failure.

Analysis – CN S&C employee's compliance Hours of Service Law: FRA's investigation determined the two signal inspectors involved in the in-service testing at Stuenkel Road worked excess hours during the in-service testing, but did not reflect it on their signalman's hours of service log – IC. Both signal inspectors corrected their signalman's hours of service log – IC to reflect the actual hours worked, once FRA questioned the validity of their original signalman's hours of service log – IC.

Conclusion: The two signal inspectors violated the Hours of Service Law and did not reflect their excess hours until questioned by FRA.

Analysis-CN's 529A: The CN's block authority system only allows one authority (529A) to be placed on a highway-rail grade crossing.

Conclusion: Had CN's dispatching system allowed more than one authority (529A) to be placed on the highway-rail grade crossing, communication between signal personnel would be required before removing such authority.

Analysis-Training of signal supervisor: CN's training history of the signal supervisor did not indicate he had received any training in policies and procedures for placing highway-rail grade crossing warning systems in-service.

Overall Conclusion: The accident was the result of CN signal personnel's failure to comply with CN rules, policies, and procedures for placing a highway-rail grade crossing warning system in-service. CN was in non-compliance with Federal regulations pertaining to interference with normal functioning of system.

FRA's investigation determined the changes made to the programming of GCP 4000 Unit No. 1 resulting in the activation failure, could have been made by one of only three individuals. An S&C manager and two signal inspectors had access to the GCP 4000 units and were capable of making the program changes in question, but when interviewed no one of the three admitted to making the program change.

Although this accident did not meet the criteria for FRA post-accident testing due to the highway-rail grade crossing exception, it did meet the criteria for FRA reasonable cause testing under the accident/incident criteria in 219.301 (b)(2). Although FRA reasonable cause testing is optional, it is FRA's opinion that CN should have performed FRA reasonable cause testing of the signalman who was involved in the testing of the highway-rail grade crossing at the time of the accident. According to CN, they only conduct FRA reasonable cause testing on train employees; however, their railroad plan does not limit such testing to train employees.

Probable cause:
The probable cause of the accident was the warning time was less than 20 seconds, attributed to the signal system's failure to de-energize the warning system control circuit while ATK 392 was on the approach circuit.

Contributing causes:

The first contributing cause of the accident was Stuenkel Road's highway-rail grade crossing warning system was placed in-service before it was determined the warning system and its component parts were in a condition to perform their intended function.

A second contributing cause of the accident may have been CN signal personnel's failure to comply with Federal regulations and CN rules, policies, and procedures.