Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-11

Canadian National/Metra (CN/NIRC)
Chicago, Illinois
March 7, 2007

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-2007-11

1.Name of Railroad Operating Train #1: Canadian National - North America [CN]	1a. Alphabetic Code: CN	1b. Railroad Accident/Incident No.: 548474
2.Name of Railroad Operating Train #2: Northeast IL Regional Commuter Rail Corp. [NIRC]	2a. Alphabetic Code: NIRC	2b. Railroad Accident/Incident No.: SWA0009
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: Amtrak [ATK]	4a. Alphabetic Code: ATK	4b. Railroad Accident/Incident No.: 103734
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 03 Day 07 Year 2007	7. Time of Accident/Incident: 09:56:00 ☐ 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: 02

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 TERMINAL

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
CHICAGO	1.4	N/A	IL	COOK

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
20 F	4	2	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. — Code
MAIN TRACK NO. 4	2	59	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
8	2	R95491-07

29. Speed (recorded speed, if available) R - Recorded E - Estimated — Code	31. Method(s) of Operation (enter code(s) that apply)	31a. Remotely Controlled Locomotive?
14 MPH — R	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)	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): 0	Code(s): f N/A N/A N/A N/A	0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	UP6522	1	N/A
(2) Causing (if mechanical cause reported)	0	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
00	1

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

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	2	0	0	0	0
(2) Total Derailed	1	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	0	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
20000	1000	H017	N/A

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 2 Mi 56	Hrs 2 Mi 56

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: 2

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
3	1	SWS 839

56. Speed (recorded speed, if available) R - Recorded E - Estimated — Code	58. Method(s) of Operation (enter code(s) that apply)	58a. Remotely Controlled Locomotive?
0 MPH — R	a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track	0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons (gross tonnage, excluding power units): 0

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): f | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: 0

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	NIRC101	1	no
(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): Y

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	2	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	1	0	8	0
(2) Total Derailed	0	0	0	1	0

64. Equipment Damage This Consist: 36000

65. Track, Signal, Way, & Structure Damage: 1000

66. Primary Cause Code: H017

67. Contributing Cause Code: N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
1	0	1	1

Length of Time on Duty

72. Engineer/Operator: Hrs 8 Mi 28

73. Conductor: Hrs 8 Mi 28

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: 2

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

79. Caboose Occupied by Crew? 1. Yes 2. No: 2

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: N/A

82. Train Number/Symbol: N/A

83. Speed (recorded speed, if available) Code: R - Recorded; E - Estimated: N/A MPH: 0

84. Trailing Tons (gross tonnage, excluding power units): 0

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)	0	0	N/A
(2) Causing (if mechanical cause reported)	0	0	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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

90. 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

91. Equipment Damage This Consist: 0

92. Track, Signal, Way, & Structure Damage: 0

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
0	0	0	0

Length of Time on Duty

99. Engineer/Operator: Hrs 0 Mi 0

100. Conductor: Hrs 0 Mi 0

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	0	0	0
Nonfatal	0	0	0

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: 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)

108. Vehicle Speed (est. MPH at impact): N/A

109. geographical) Code: N/A
1.North 2.South 3.East 4.West

Rail Equipment Involved

111. 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)

112. Position of Car Unit in: N/A

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110. Position 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	Code N/A
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 N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A
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 N/A	117. Whistle 1. Yes 2. No 3. Unknown	Code N/A
Code(s)	N/A	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 N/A	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code N/A	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code N/A

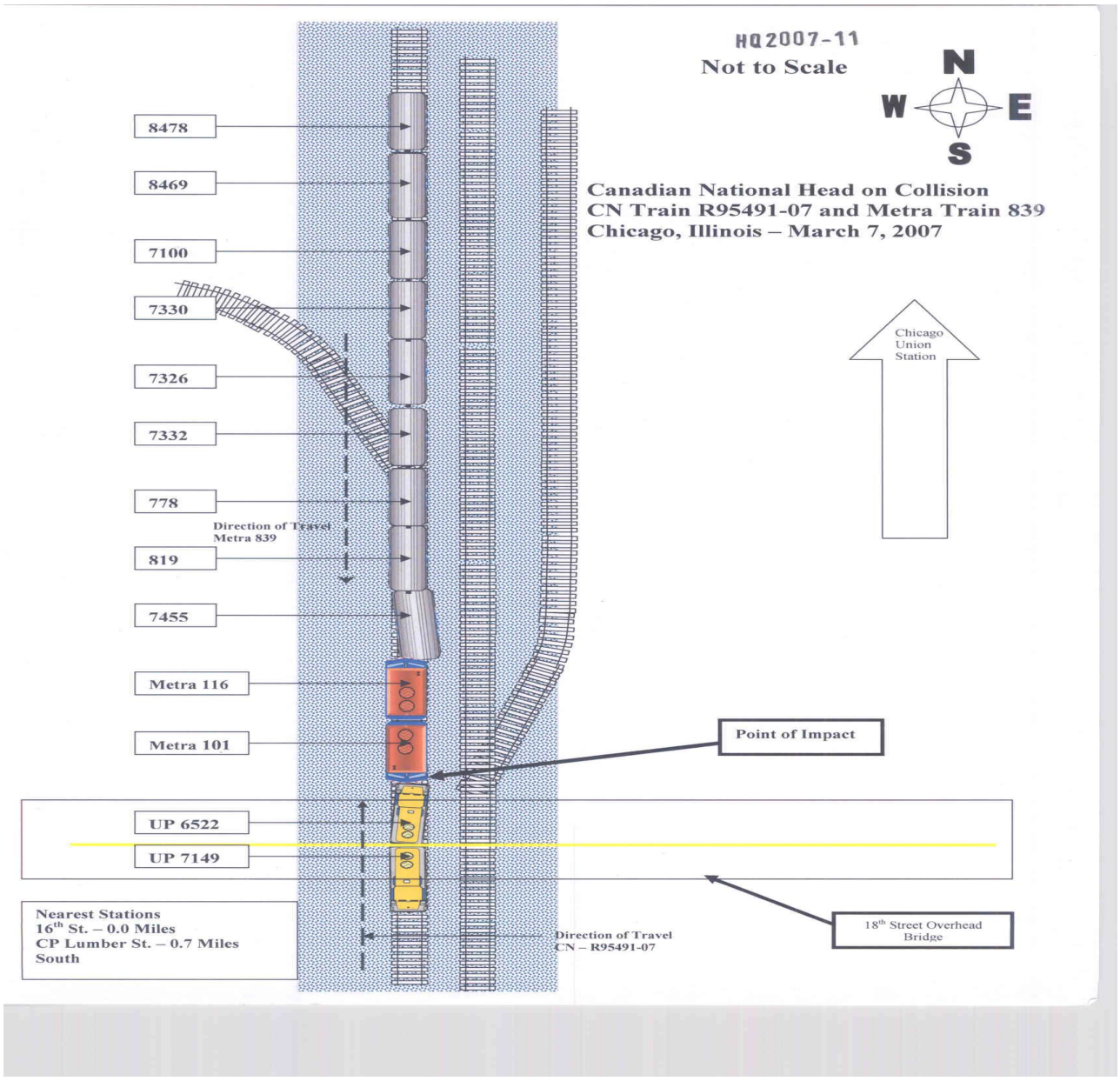
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify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

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code N/A	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 N/A

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

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

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



137. SYNOPSIS OF THE ACCIDENT

Synopsis of the Accident

On March 7, 2007, at 9:56 p.m., c.s.t., two unattended locomotives from Canadian National Railroad (CN) Train No. R95491-07 (R95491-07) collided head-on with stopped westbound Northeast Illinois Regional Commuter Rail Corporation (NIRC) Commuter Train No. SWS 839 (SWS 839), on Amtrak's (ATK) Main Track No. 4. The collision occurred in Chicago, Illinois, at ATK Milepost 1.4 in the Chicago Terminal. Six passengers and two NIRC employees received minor injuries. The collision derailed the lead truck on the striking locomotive and the lead truck of the first coach in the commuter train. There was no fire and no hazardous materials involved. At the time of the accident it was cloudy and the temperature was 20 F.

The lead locomotive of the CN train sustained about $20,000 damage, and both locomotives and two coaches of the NIRC commuter train sustained a total of $36,000 damage. Damage to ATK's Main Track No. 4 was about $1,000.

The cause of the accident was the failure to apply hand brakes on the locomotives of R95491-07 before leaving them unattended on a .59-percent grade, which enabled them to roll, striking SWS 839.

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138. NARRATIVE

Circumstances Prior to the Accident

The collision occurred on ATK's Main Track No. 4 in the Chicago Terminal in the 16th Street Interlocking between Control Point (CP) Roosevelt and CP Lumber Street. The method of operation at this location is Interlocking Limits. The interlocking is controlled by ATK's Chicago Union Station, South Train Director.

The R95491-07 had been operating on the CN Freeport Subdivision, which begins in Chicago at 16th Street, milepost 2.1, and runs in a geographic southwest direction. Trains departing 16th Street operate in timetable direction west. The method of operation between milepost 2.1 and Ash Street, milepost 5.6, is Centralized Traffic Control. Maximum timetable speed for freight trains operating in this area is 25 mph.

CN Train No. R95491-07
The crew of R95491-07 included a locomotive engineer, a conductor, and a conductor trainee. They went on duty as a yard crew at 7 p.m., March 7, 2007, at CN's Hawthorne Yard in Chicago. Hawthorne Yard is located on the Freeport Subdivision of the CN Chicago Division. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty.

After the crew went on duty, the yardmaster instructed them to take a freight train from Hawthorne Yard, milepost 8.9, to Bridgeport Yard, milepost 4.4. When they arrived at Bridgeport Yard, they were to uncouple the locomotives from the east end of the train, operate the locomotives on an adjacent track to the west end of the yard and couple them to the west end of the train. The crew would then be transported back to Hawthorne Yard in a company vehicle.

The R95491-07 had two Union Pacific (UP) locomotives, UP 6522 and UP 7149, and 91 cars. UP 6522 was the controlling locomotive. After making the required air brake test at Hawthorne Yard, the train made the trip to Bridgeport Yard without incident.

On arrival at Bridgeport Yard at about 9:35 p.m., the crew uncoupled the locomotives from the east end of the train. They then moved the locomotives ahead 1,503 feet to clear a switch that would enable them to operate to the opposite end of the train.

The locomotive engineer stopped the movement at 9:37 p.m., using the independent air brakes. As the locomotives stopped, the engineer centered and removed the reverser from the control stand, and made a service reduction with the automatic brake valve. Before the brakes had fully applied, the engineer began the procedure to change operating ends to the trailing locomotive. He did this by placing the brake system of the lead locomotive in the "Trail" position.

Before the engineer completed the procedure for changing operating ends, the crew decided to go for something to eat at a nearby restaurant. All three crew members got off the locomotive and walked to a restaurant located about 350 feet northwest of where the locomotives were standing.

A security camera inside the restaurant indicated the time the crew entered the restaurant as 9:42 p.m. The crew members walked to the counter, placed their orders, and after receiving their orders for food, left the restaurant. The engineer exited the restaurant at 9:53:40 p.m., followed by the trainee at 9:53:45 p.m., and the conductor 9:53:59 p.m.

A security camera outside the restaurant showed the trailing locomotive standing on the grade across the street, southeast of the restaurant. At 9:53:04 p.m., the locomotive began to slowly move downgrade to the northeast. The locomotive event recorder data indicates movement began at 9:53:12 p.m. At 9:53:55 p.m., the camera recorded the engineer running across the parking lot to pursue the locomotive consist. At 9:54:10 p.m., the other two crew members were seen moving quickly in the same direction.

The route traversed by the unattended CN locomotive consist begins on a .59-percent descending grade in a left-hand curve, which runs northeast to a connection with ATK at CN Milepost 2.9, approximately 1,034 feet geographically south of the point where the collision occurred. Beyond the connection, ATK trackage is tangent, running in a geographically south-north direction. The track ascends briefly on the approach to a lift bridge spanning the south branch of the Chicago River. North of the bridge the .59-percent descending grade continues to the point of the collision.

CN Train No. R95491-07
The crew of R95491-07 included a locomotive engineer, a conductor, and a conductor trainee. They went on duty as a yard crew at 7 p.m., March 7, 2007, at CN's Hawthorne Yard in Chicago. Hawthorne Yard is located on the Freeport Subdivision of the CN Chicago Division. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty.

After the crew went on duty, the yardmaster instructed them to take a freight train from Hawthorne Yard, milepost 8.9, to Bridgeport Yard, milepost 4.4. When they arrived at Bridgeport Yard, they were to uncouple the locomotives from the east end of the train, operate the locomotives on an adjacent track to the west end of the yard and couple them to the west end of the train. The crew would then be transported back to Hawthorne Yard in a company vehicle.

The R95491-07 had two Union Pacific (UP) locomotives, UP 6522 and UP 7149, and 91 cars. UP 6522 was the controlling locomotive. After making the required air brake test at Hawthorne Yard, the train made the trip to Bridgeport Yard without incident.

On arrival at Bridgeport Yard at about 9:35 p.m., the crew uncoupled the locomotives from the east end of the train. They then moved the locomotives ahead 1,503 feet to clear a switch that would enable them to operate to the opposite end of the train.

The locomotive engineer stopped the movement at 9:37 p.m., using the independent air brakes. As the locomotives stopped, the engineer centered and removed the reverser from the control stand, and made a service reduction with the automatic brake valve. Before the brakes had fully applied, the engineer began the procedure to change operating ends to the trailing locomotive. He did this by placing the brake system of the lead locomotive in the "Trail" position.

Before the engineer completed the procedure for changing operating ends, the crew decided to go for something to eat at a nearby restaurant. All three crew members got off the locomotive and walked to a restaurant located about 350 feet northwest of where the locomotives were standing.

A security camera inside the restaurant indicated the time the crew entered the restaurant as 9:42 p.m. The crew members walked to the counter, placed their orders, and after receiving their orders for food, left the restaurant. The engineer exited the restaurant at 9:53:40 p.m., followed by the trainee at 9:53:45 p.m., and the conductor 9:53:59 p.m.

A security camera outside the restaurant showed the trailing locomotive standing on the grade across the street, southeast of the restaurant. At 9:53:04 p.m., the locomotive began to slowly move downgrade to the northeast. The locomotive event recorder data indicates movement began at 9:53:12 p.m. At 9:53:55 p.m., the camera recorded the engineer running across the parking lot to pursue the locomotive consist. At 9:54:10 p.m., the other two crew members were seen moving quickly in the same direction.

An ATK video camera, mounted on the bridge, recorded the locomotives traveling northbound on Main Track No. 4. The locomotives appeared at 9:51:35 p.m., and disappeared from view at 9:52:59 p.m. At 9:53:20 p.m., a figure identified as the CN engineer appeared on the recording, quickly walking northbound on the walkway on the west side of Main Track No. 4. He disappeared from view at 9:53:37 p.m. At 9:55:43 p.m., two figures, identified as the CN conductor and trainee, were recorded walking northbound on the walkway between the two tracks. They disappeared from view at 9:56:30 p.m.

The unattended locomotives reached a speed of 10 mph as they passed the absolute signal displaying a "Stop" indication at the ATK CP Lumber Street junction point of the CN and ATK. The locomotives trailed through a switch aligned against their movement, before entering ATK trackage at CP Lumber Street.

After entering ATK trackage, the locomotives briefly slowed to 2 mph as they ascended a slight grade at the south approach to the bridge. Just north of the bridge, the locomotives passed another absolute signal displaying a "Stop" indication. The locomotives then crossed the Lumber Street highway-rail crossing, and increased speed as it rolled down the grade to the point where the collision occurred. The unattended locomotives traveled 1,789 feet from the point where the train crew left them, to the point of impact with SWS 839.

NIRC Train No. SWS 839
The crew of SWS 839 included a locomotive engineer, a conductor, and a brakeman. The crew first went on duty at 1:28 p.m., March 7, 2007, at 179th Street station in Orland Park, Illinois. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty.

Their assigned commuter train consisted of two locomotives and nine bi-level passenger coaches. They were scheduled to make three round trips to Chicago Union Station, with SWS 839 as their final trip, before going off duty at Orland Park.

SWS 839 departed Chicago Union Station on time at 9:50 p.m., with 55 passengers. All passengers and two crew members were in the rear car of the train. As they approached the absolute signal at CP Lumber Street, the engineer observed the

signal change from "Slow Clear" to a more restrictive indication of "Approach." The engineer believed something was wrong and made a normal service brake reduction, bringing his train to a stop directly beneath the 18th Street overpass. The locomotive event recorder on the train recorded the stop time as 9:55:36 p.m.

Seconds later, the engineer saw a locomotive, with no headlight illuminated, coming slowly towards him across the bridge. Unaware that the locomotive was unattended, the NIRC engineer flashed his headlight several times in an attempt to alert the crew of the locomotive. Concerned that it might be a coal train, the engineer picked up the radio handset, radioed a warning to his conductor, then braced himself for the impact.

The Accident

The unattended locomotives struck SWS 839 head-on. Locomotive event recorder data from UP 6522 indicates the collision occurred at 9:56:40 p.m. at a recorded speed of 14 mph. Locomotive event recorder data from NIRC locomotive 101 indicate that the impact pushed the train backward 34 feet.

The collision derailed the lead truck of the striking locomotive, UP 6522, and the lead truck of the first coach of SWS 839. The engineer, brakeman and six passengers on the train sustained injuries and were transported to local hospitals.

This accident met the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing. The crew members of the striking train were tested under this authority and one test was positive for a controlled substance.

Analysis and Conclusion

Analysis - Train Crew Operating Performance:
The certified locomotive engineer of R95491-07, a 56 year old male, was in possession of a valid certification card at the time of the accident, and was qualified on the territory. He was promoted to locomotive engineer by the Chicago and NorthWestern Transportation Company in 1980 and entered service for the CN on March 22, 1994. He said he was alert and was fully rested when he reported for duty less than four hours earlier.

Prior to leaving the locomotives unattended, the engineer prepared to change operating ends of the locomotives by placing the MU-2A brake valve (MU valve) on the controlling locomotive in "Trail" position. This procedure is necessary so the locomotive brake will operate properly when the locomotives are operated from the locomotive at the opposite end.

Under normal circumstances this is not a problem, because the engineer then continues the procedure by immediately proceeding to the locomotive at the opposite end of the locomotive consist. The MU valve on that locomotive is placed in "Lead" position, which allows operation of the brake system from that locomotive.

Because the engineer failed to complete the procedure, the brake valves on both locomotives were left in "Trail" position. This prevented the charging valve from maintaining brake cylinder pressure that could be lost due to normal leakage.

Information obtained from the locomotive event recorder download indicates the engineer improperly initiated the procedure by not waiting for the automatic brake to fully apply. This resulted in the automatic brake developing brake cylinder pressure of 68 pounds per square inch (lbs. psi) instead of the full 73 lbs. psi.

CN U.S. Operating Rules, Third Edition, effective 1200, Sunday October 30, 2005, Rule 104.1, states, Engineers are responsible for safely and efficiently operating the engine. . . .

CN Air Brake & Train Handling Rules, (ABTH) Third Edition, Effective 1200 Sunday, September 5, 2004, Rule 401(B), "Procedure for changing Ends on EPIC Brake Equipment," 4041(B)(9), states,
(after setting up the lead locomotive as the trailing locomotive) . . . Proceed without delay to the other end of the locomotive consist. (The engineer is then required to immediately "cut in" (activate) the MU valve on that locomotive.)

ABTH Rule 410, Unattended Locomotives. F., states, Apply the hand brake on each locomotive left unattended outside of a mechanical facility or yard. Within yards and mechanical facilities, only apply one hand brake per consist, unless otherwise instructed.

49 CFR, Part 223.103, states,
(n) Securement of unattended equipment. A train's air brake shall not be depended upon to hold equipment standing unattended on a grade (including a locomotive, a car, or a train whether or not locomotive is attached) . . . Unattended equipment shall be secured in accordance with the following requirements:
232.103(n)(1)
(1) A sufficient number of hand brakes shall be applied to hold the equipment . . .

(232.103(n)(3)(ii)
(ii) All hand brakes shall be fully applied on all locomotives in an unattended locomotive consist outside of yard limits.

The conductor was a 33 year old male, who entered service for the CN on February 13, 2006. He was promoted to conductor on December 1, 2006. He said he was alert and was fully rested when he reported for duty less than four hours earlier.

The trainee was a 32 year old male, who entered service for the CN on February 12, 2007. He said he was alert and was fully rested when he reported for duty less than four hours earlier.

Conclusion:
Although the locomotives were standing on a .59-percent grade, the engineer of R95491-07 failed to apply the hand brakes on the locomotive consist before leaving it unattended.

Analysis - Motive Power and Equipment:
Brake rigging, brake shoes, and piston travel were inspected after the accident with no exception taken. Both locomotive hand brakes were applied and released after the accident, with no exception taken.

A post-accident brake test, witnessed by an FRA Motive Power and Equipment (MP&E) inspector, was conducted by CN officers the following day. After determining that the brakes on both locomotives functioned as intended, an air brake leakage test was conducted by the following method.

First, a 20 lb. psi automatic brake valve reduction was made on the lead locomotive, which resulted in 73 lbs. psi brake cylinder pressure. The MU valve was then placed in "Trail" position and the brake cylinder pressure gage observed to determine the rate of leakage. Under these conditions, the brakes fully released in 23 minutes. Leakage did not exceed the limits set by 49 CFR, Part 229.59, a-d.

Conclusion:
The locomotive brakes were functioning as intended and were not related to the cause of the accident.

Analysis - Toxicological Testing:
This accident met the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing. The crew members of the striking train were tested under this authority. One crew member, who was not the engineer, tested positive for a controlled substance.

Conclusion:
The FRA determined toxicological impairment was not a causal factor with regard to the accident.

Analysis - Fatigue:
FRA obtained fatigue related information, including a 10-day work history, for six employees involved in accident HQ 2007-11, including the engineer, conductor, and conductor trainee of R94591-07 and the engineer, conductor and brakeman of SWS 839.

Conclusion:
FRA concluded fatigue was not probable for any of the employees.

Probable Cause
The FRA found that the cause of the accident was the failure to apply hand brakes on the locomotives of R95491-07 before leaving them unattended on a .59-percent grade, which enabled them to roll, striking SWS 839.

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