



***Federal Railroad Administration  
Office of Safety  
Headquarters Assigned  
Accident Investigation Report  
HQ-2005-58***

***Norfolk Southern (NS)  
Danville, Pennsylvania  
August 1, 2005***

***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 # <u>HQ-2005-58</u>	
1. Name of Railroad Operating Train #1 Canadian Pacific Rwy Co. [CP ]				1a. Alphabetic Code CP		1b. Railroad Accident/Incident No. 192528	
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: Canadian Pacific Rwy Co. [CP ]				3a. Alphabetic Code CP		3b. Railroad Accident/Incident No. 192528	
4. U.S. DOT_AAR Grade Crossing Identification Number				5. Date of Accident/Incident Month Day Year 08 01 2005		6. Time of Accident/Incident 04:55:00 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
7. Type of Accident/Incident (single entry in code box)		1. Derailment 2. Head on collision 3. Rear end collision		4. Side collision 5. Raking collision 6. Broken Train collision		7. Hwy-rail crossing 8. RR grade crossing 9. Obstruction	
						10. Explosion-detonation 11. Fire/violent rupture 12. Other impacts	
						13. Other (describe in narrative) 01	
8. Cars Carrying HAZMAT 1		9. HAZMAT Cars Damaged/Derailed 0		10. Cars Releasing HAZMAT 0		11. People Evacuated 0	
						12. Division NORTHEAST US	
13. Nearest City/Town RIVERSIDE				14. Milepost (to nearest tenth) 742.6		15. State Abbr Code N/A PA	
16. County NORTHUMBERLAND							
17. Temperature (F) (specify if minus) 88 F		18. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 2		19. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 1		20. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1	
21. Track Name/Number FREIGHT MAIN LINE				22. FRA Track Code Class (1-9, X) 3		23. Annual Track Density (gross tons in millions) 14	
				24. Time Table Direction Code 1. North 3. East 1			
OPERATING TRAIN #1							
25. Type of Equipment Consist (single entry)		1. Freight train 4. Work train 7. Yard/switching A. Spec. MoW Equip. Code 2. Passenger train 5. Single car 8. Light loco(s). 3. Commuter train 6. Cut of cars 9. Maint./inspect.car		26. Was Equipment Attended? Code 1. Yes 2. No 1		27. Train Number/Symbol 413-01	
28. Speed (recorded speed, if available) Code R - Recorded 37 MPH R E - Estimated		30. Method(s) of Operation (enter code(s) that apply) 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) Code(s) e. Traffic k. Direct traffic control f. Interlocking l. Yard limits				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	
29. Trailing Tons (gross tonnage, excluding power units) 7470							
31. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded (yes/no)	
(1) First involved (derailed, struck, etc)		N/A		54		N/A	
(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/A	
34. Locomotive Units		a. Head End		Mid Train		Rear End	
		b. Manual		c. Remote		d. Manual c. Remote	
(1) Total in Train		3		0		0	
(2) Total Derailed		0		0		0	
						35. Cars	
						a. Freight b. Pass. c. Freight d. Pass. e. Caboose	
						(1) Total in Equipment Consist 49 0 43 0 0	
						(2) Total Derailed 7 0 18 0 0	
36. Equipment Damage This Consist 475280.		37. Track, Signal, Way, & Structure Damage 150000.		38. Primary Cause Code H607		39. Contributing Cause Code N/A	
Number of Crew Members				Length of Time on Duty			
40. Engineer/Operators N/A		41. Firemen N/A		42. Conductors 1		43. Brakemen N/A	
						44. Engineer/Operator Hrs 4 Mi 25	
						45. Conductor Hrs 4 Mi 25	
Casualties to:		46. Railroad Employees		47. Train Passengers		48. Other	
Fatal		0		0		0	
Nonfatal		N/A		0		0	
						49. EOT Device? 1. Yes 2. No 1	
						50. Was EOT Device Properly Armed? 1. Yes 2. No 1	
						51. Caboose Occupied by Crew? 1. Yes 2. No 2	
OPERATING TRAIN #2							
52. Type of Equipment Consist (single entry)		1. Freight train 4. Work train 7. Yard/switching A. Spec. MoW Equip. Code 2. Passenger train 5. Single car 8. Light loco(s). 3. Commuter train 6. Cut of cars 9. Maint./inspect.car		53. Was Equipment Attended? Code 1. Yes 2. No N/A		54. Train Number/Symbol N/A	
55. Speed (recorded speed, if available) Code R - Recorded 0 MPH N/A E - Estimated		57. Method(s) of Operation (enter code(s) that apply) a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic 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) N/A   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	
58. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded(yes/no)	
(1) First involved (derailed, struck, etc)		0		N/A		N/A	
(2) Causing (if mechanical cause reported)		0		N/A		N/A	
						59. 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	
						60. Was this consist transporting passengers? (Y/N) N/A	
61. Locomotive Units		a. Head End		Mid Train b. Manual   c. Remote		Rear End d. Manual   c. Remote	
(1) Total in Train		0		0   0		0   0	
(2) Total Derailed		0		0   0		0   0	
63. Equipment Damage This Consist		0		64. Track, Signal, Way, & Structure Damage		0	
						65. Primary Cause Code N/A	
						66. Contributing Cause Code N/A	
						Length of Time on Duty	
67. Engineer/Operators N/A		68. Firemen N/A		69. Conductors N/A		70. Brakemen N/A	
71. Engineer/Operator Hrs   0   Mi   0		72. Conductor 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				Rail Equipment Involved			
79. Type C. Truck-Trailer   F. Bus   J. Other Motor Vehicle   Code A. Auto   D. Pick-Up Truck   G. School Bus   K. Pedestrian B. Truck   E. Van   H. Motorcycle   M. Other (spec. in narrative)   N/A				83. Equipment 3. Train (standing)   6. Light Loco(s) (moving)   Code 1. Train(units pulling)   4. Car(s)(moving)   7. Light(s) (standing) 2. Train(units pushing)   5. Car(s)(standing)   8. Other (specify in narrative)   N/A			
80. Vehicle Speed (est. MPH at impact)   N/A				81. Direction (geographical) 1. North   2. South   3. East   4. West   N/A			
82. Position 1. Stalled on Crossing   2. Stopped on Crossing   3. Moving Over Crossing 4. Trapped   N/A				84. Position of Car Unit in Train N/A			
85. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User   N/A				86a. 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   N/A			
86b. Was there a hazardous materials release by 1. Highway User   2. Rail Equipment   3. Both   4. Neither   N/A							
86c. State here the name and quantity of the hazardous materials released, if any. N/A							
87. Type of Crossing Warning		1. Gates   4. Wig Wags   7. Crossbucks   10. Flagged by crew 2. Cantilever FLS   5. Hwy. traffic signals   8. Stop signs   11. Other (spec. in narr.) 3. Standard FLS   6. Audible   9. Watchman   12. None		88. Signaled Crossing Warning (See instructions for codes)		89. Whistle Ban 1. Yes   2. No   3. Unknown   N/A	
Code(s)		N/A   N/A   N/A   N/A   N/A   N/A   N/A					
90. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach   N/A		Code		91. Crossing Warning Interconnected with Highway Signals 1. Yes   2. No   3. Unknown   N/A		Code	
92. Crossing Illuminated by Street Lights or Special Lights 1. Yes   2. No   3. Unknown   N/A							
93. Driver's Age 0		94. Driver's Gender 1. Male   2. Female   N/A		95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes   2. No   3. Unknown   N/A		96. Driver 1. Drove around or thru the Gate   4. Stopped on Crossing 2. Stopped and then Proceeded   5. Other (specify in narrative) 3. Did not Stop   N/A	
97. Driver Passed Standing Highway Vehicle 1. Yes   2. No   3. Unknown   N/A		Code		98. View of Track Obscured by (primary obstruction) 1. Permanent Structure   3. Passing Train   5. Vegetation   7. Other (specify in narrative) 2. Standing Railroad Equipment   4. Topography   6. Highway Vehicle   8. Not obstructed   N/A		Code	
101. Casualties to Highway-Rail Crossing Users		Killed   Injured 0   0		99. Driver Was 1. Killed   2. Injured   3. Uninjured   N/A		100. Was Driver in the Vehicle? 1. Yes   2. No   N/A	
				102. Highway Vehicle Property Damage (est. dollar damage) 0		103. Total Number of Highway-Rail Crossing Users (include driver) 0	
104. Locomotive Auxiliary Lights? 1. Yes   2. No   N/A		Code		105. Locomotive Auxiliary Lights Operational? 1. Yes   2. No   N/A		Code	
106. Locomotive Headlight Illuminated? 1. Yes   2. No   N/A		Code		107. Locomotive Audible Warning Sounded? 1. Yes   2. No   N/A		Code	

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

## 109. SYNOPSIS OF THE ACCIDENT

## SYNOPSIS OF THE ACCIDENT

On Monday, August 1, 2005, Canadian Pacific Railway train 413-01, consisting of mixed freight was traveling North on the Freight Main Line, single track, with a Form D from CP-Kase (Milepost 752) to Milepost 729.

At 4:55 p.m., the train experienced an emergency brake application in the vicinity of the Merck Chemical Plant switch, Milepost 742.6, Riverside, PA. Upon the conductor inspecting the train, he found 25 various cars derailed.

There were no injuries to the train crew. The locomotives received no damage. The estimated equipment damage was \$475,280.27 and track damage was \$150,000.00.

At the time of the accident it was daylight and clear. The temperature was 88 degrees Fahrenheit.

The accident was caused by the train going 37 mph in a 25 mph temporary slow order between mileposts 742 and 743, due to the conductor giving the engineer the wrong temporary speed restriction removal.

The 25 mph slow order was protecting track that had been undercut nineteen days prior (July 13, 2005) and the track was tight (in compression).

## 110. NARRATIVE

## CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of Canadian Pacific Railway train 413-01, Norfolk Southern Railway Company Symbol 12RHX31 Northbound included a locomotive engineer and a conductor. They first went on duty at 12:30 p.m. EDT, August 1, 2005 at Norfolk Southern Railway Company's Enola Yard, located in Enola, PA. This was the away from home terminal for all crew members, and the crew members had more than the statutory off duty period, as follows:

&#63570; Engineer, 8 hours and 16 minutes rest prior to duty

&#63570; Conductor, 8 hours and 16 minutes rest prior to duty

Train 413-01 (Norfolk Southern Railway Company Symbol 12RHX31) ,a freight train, consist information as follows,

&#63570; Three locomotives, NS 8958 - Lead  
NS 9976 - Trailing  
NS 9974 - Trailing

&#63570; 49 Loads  
&#63570; 43 Empties  
&#63570; 7,470 Gross Tonnage excluding power units  
&#63570; 5502' Length

The train was ordered to depart Enola, PA and travel North to Binghamton, NY. The train made a two track double from 10 Eastbound Receiving to 14 Eastbound Receiving. The train received an Initial Terminal Brake Test, and departed Enola yard for Binghamton at 2 p.m.

At 2:34 p.m., while the train was going across the Rockville Bridge, a Norfolk Southern Railway Company maintainer called the crew and notified them that the 29th car from the rear, NS 469767 had sparks flying and wheels sliding. The crew notified the Norfolk Southern Railway Company Harrisburg Terminal Dispatcher, who told the train to clear CP-Wye interlocking. After clearing the interlocking the conductor requested "3 step protection" and reported a handbrake was applied on the car. After releasing the handbrake and releasing "3 step protection" the conductor started walking toward the front of the train, he noticed 3 cars with handbrakes applied. The conductor requested "three step protection" again and released the handbrakes on the 62nd, 63rd, and 64th cars: CP 220363, BAR 5831, CP 220254. The conductor released the "three step protection" and proceeded to the locomotives. At 3:16 p.m., the crew notified the train dispatcher that a block of three cars had handbrakes applied and that the they were released, and the train was on the move North.

Around 4:15 p.m., as the northbound train was approaching Selinsgrove Junction, the Engineer attempted to "tone in" the train dispatcher three to four times with no success. The Conductor used his company cell phone to call the Canadian Pacific Railway South End Dispatcher to obtain a Form D to operate on the Freight Main Line. Before the dispatcher issued the form D, he removed the 25 mph speed restriction between milepost 642 and 643. The conductor repeated correctly the speed restriction removal to the dispatcher. The dispatcher then issued Form D 752 to operate in a North direction on Main track between CP-Kase and milepost 729. The Conductor correctly repeated the Form D. The dispatcher made the Form D effective 4:18 p.m. After talking to the Dispatcher, the Conductor walked over to the Engineer to hold a job safety briefing. He gave the Engineer a copy of Form D 752, discussed the limits of the Form D and told him that the speed restriction from

milepost 742 and 743 was removed. The Engineer repeated back the speed restriction removal and the Conductor confirmed it.

When the train arrived at CP-Kase, the train dispatcher issued an addition to the Form D and a speed restriction at milepost 725. After another job briefing the conductor stated to the engineer, "We're okay all the way to 716."

After the train went over the detector at milepost 747.1, it gave the correct axle count, stating no defects, but it gave a temperature of minus 72 degrees. According to the conductor, this had been occurring for a while now. When the train approached milepost 745 both engineer and conductor confirmed two miles in advance that the speed restriction between milepost 743 and 742 was off.

As the northbound train approached the accident area, the locomotive engineer was seated at the controls on the west side of the leading locomotive. The conductor was seated on the east side of the leading locomotive.

In this area of the railroad there is a right hand two degree curve, with a .14 percent ascending grade. The railroad timetable direction of the train was north. The geographic direction was northeast. Timetable directions are used throughout this report.

#### The Accident - Canadian Pacific Railway Train 413-01 North

The train was being operated at 39 mph approaching the accident area. At the time the accident occurred the train was being operated at 37 mph. Both speeds were recorded by the event recorder of the controlling locomotive. The maximum authorized speed for mixed freight trains is 25 mph, as designated in the D&H daily operating bulletin, DOB D212, effective 7 p.m. EDT, July 31, 2005. After the train experienced an emergency brake application in the vicinity of milepost 742.6, about 122 miles South of Binghamton, New York, The engineer called "emergency, emergency, emergency" on the radio, and tried to "tone in" the train dispatcher on the "banks" radio base three times with no success. The engineer then tried "toning" the Catawissa radio base and succeeded. The train dispatcher answered and the engineer told him that the train was in emergency in South Danville, and he could not recover the air to the train.

As the Conductor left the locomotive and walked back about 52 cars, he was met by officials from the Merck Chemical plant and local police. They wanted to know if there were any hazardous material cars in the train. The Conductor called the Engineer who notified him that there was one dangerous car, the second to the last car in the train. The Conductor was taken by vehicle to the rear of the train to look at the hazardous material car. The car was not derailed, and the Conductor walked the rest of the train to see where the cars had derailed, determining that there were about 25 cars derailed. As the Conductor walked toward the locomotives, he was approached by two police officers who asked him if the train could clear the crossings. The Conductor called the road foreman, who was dispatched to the accident, and asked him if they could clear the crossings. The road foreman told them they could move the train and clear the crossings.

After the Canadian Pacific road foreman arrived, he took statements from both Engineer and Conductor. After the statements were given, and the Norfolk Southern trainmaster arrived, the crew took a part of their train from South Danville to Nescopeck, gave one engine to a Norfolk Southern train crew, tied the train down and taxied to Taylor, PA with the Norfolk Southern taxi. A Canadian Pacific taxi picked up the crew and took them to Binghamton, New York, where the crew was drug tested on company authority.

#### Analysis and Conclusions

The audio tape of the phone conversation between the Train Dispatcher and Conductor revealed that the speed restriction that was removed was from milepost 642 to 643. The Conductor correctly repeated the speed restriction removal to the Train Dispatcher. After the Conductor copied the Form D from the Train Dispatcher and got off the phone, he wrote "normal" on his copy of the daily operating bulletin D212, for milepost 742 and milepost 743 and crossed off milepost 642 and 643 and wrote normal beside the temporary speed restriction.

There were no temporary speed signs displayed between milepost 742 and 743. NORAC operating rule 175 does not require temporary speed signs between whole mileposts.

The locomotive was equipped with a speed indicator and an event recorder as required. The relevant event recorder data was downloaded by the Norfolk Southern trainmaster at the accident site and given to the Canadian Pacific road foreman, who analyzed the data at Canadian Pacific Taylor yard office. The analysis disclosed that the locomotive engineer operated the train 12 mph over the maximum allowed speed. FRA reviewed the results of this analysis, and concurred with the conclusions.

The daily track inspection report dated August 1, 2005 indicated no defects found between milepost 742 and 743. The temporary speed restriction between milepost 742 and 743 was not removed.

#### Probable Cause & Contributing Factor

The accident occurred because the conductor gave the engineer the incorrect removal of a temporary speed restriction resulting in the train operating at a speed in excess of that allowed by the 25 mph slow order that was still in place between milepost 742 and 743. The slow order was protecting track that had been undercut 19 days prior and not stabilized, and therefore, "tight" (in compression).