



***Federal Railroad Administration  
Office of Safety  
Headquarters Assigned  
Accident Investigation Report  
HQ-2009-55***

***Canadian Pacific (CP)  
Northbrook, IL  
November 1, 2009***

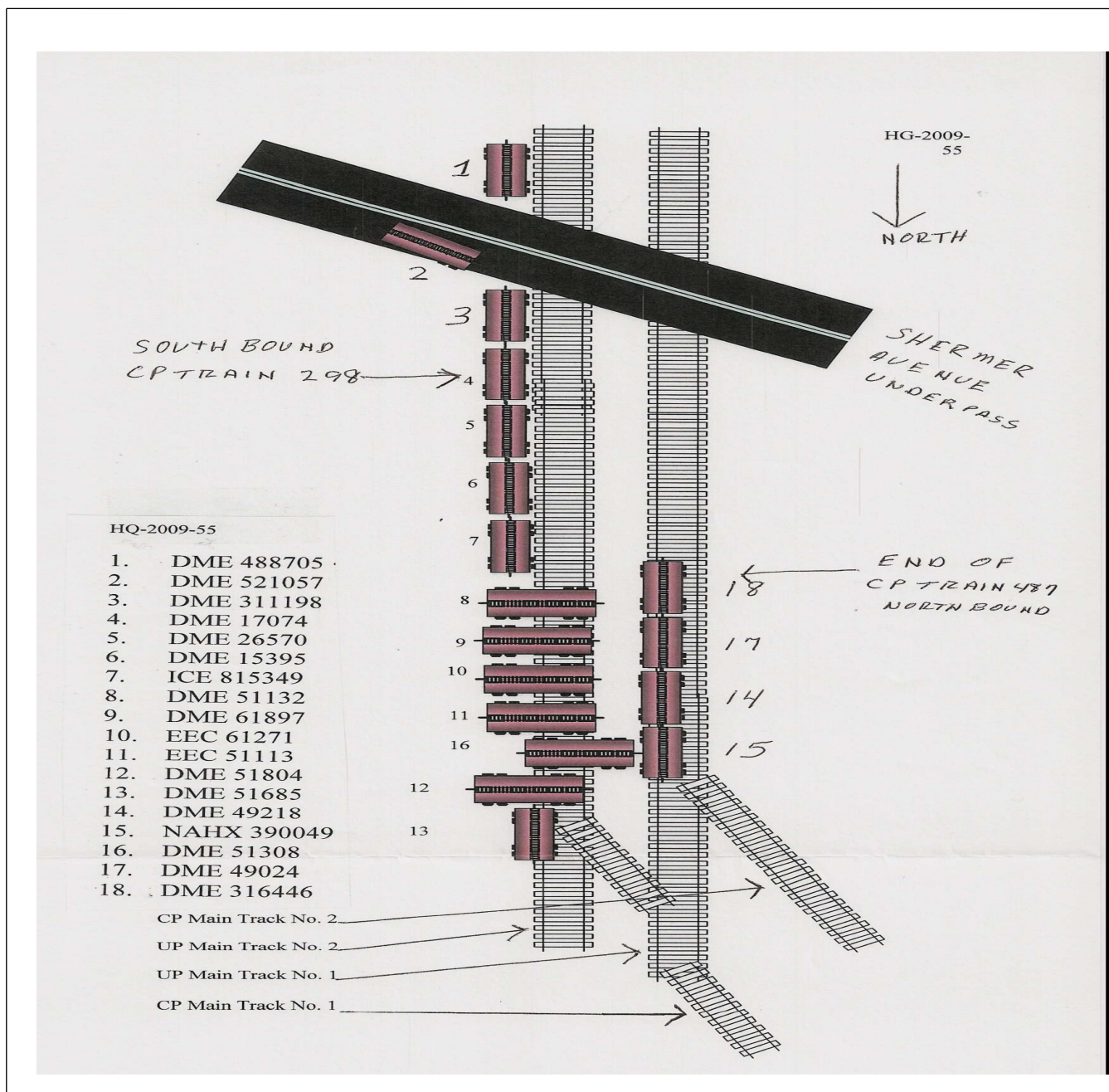
***Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.***

DEPARTMENT OF TRANSPORTATION FEDERAL RAILROAD ADMINISTRATION		FRA FACTUAL RAILROAD ACCIDENT REPORT				FRA File # <u>HQ-2009-55</u>			
1. Name of Railroad Operating Train #1 Canadian Pacific Rwy Co. [CP ]			1a. Alphabetic Code CP		1b. Railroad Accident/Incident No. 213738				
2. Name of Railroad Operating Train #2 Canadian Pacific Rwy Co. [CP ]			2a. Alphabetic Code CP		2b. Railroad Accident/Incident No. 213738				
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: Union Pacific RR Co. [UP ]			4a. Alphabetic Code UP		4b. Railroad Accident/Incident No. 1109PR001				
5. U.S. DOT_AAR Grade Crossing Identification Number			6. Date of Accident/Incident Month 11   Day 01   Year 2009		7. Time of Accident/Incident 03:01:00 <input type="checkbox"/> AM <input checked="" type="checkbox"/> 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 01		
9. Cars Carrying HAZMAT 8		10. HAZMAT Cars Damaged/Derailed 0		11. Cars Releasing HAZMAT 0		12. People Evacuated 0		13. Division Chicago	
14. Nearest City/Town Northbrook			15. Milepost (to nearest tenth) 17.5		16. State Abbr Code N/A IL		17. County COOK		
18. Temperature (F) (specify if minus) 50 F		19. Visibility (single entry) 1. Dawn 3. Dusk 2. Day 4. Dark		20. Weather (single entry) 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow		21. Type of Track 1. Main 3. Siding 2. Yard 4. Industry		Code 1	
22. Track Name/Number Main Track No. 1			23. FRA Track Class (1-9, X) 2		24. Annual Track Density (gross tons in millions) 22		25. Time Table Direction 1. North 3. East 2. South 4. West		
							Code 3		
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 4	
								27. Was Equipment Attended? 1. Yes 2. No   1	
								28. Train Number/Symbol 298-29	
29. Speed (recorded speed, if available) Code R - Recorded E - Estimated 23 MPH   R			31. 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) e. Traffic k. Direct traffic control Code(s) f. Interlocking l. Yard limits				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		
30. Trailing Tons (gross tonnage, excluding power units) 13725							0		
32. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded (yes/no)		33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	
(1) First involved (derailed, struck, etc)		DME488705		67		yes		Alcohol 0   Drugs 0	
(2) Causing (if mechanical cause reported)		0		0		N/A		34. Was this consist transporting passengers? (Y/N) N	
35. Locomotive Units		a. Head End		Mid Train		Rear End		36. Cars	
		b. Manual		c. Remote		d. Manual		c. Remote	
(1) Total in Train		2		0		0		(1) Total in Equipment Consist	
(2) Total Derailed		0		0		0		(2) Total Derailed	
		0		0		0		14	
		0		0		0		0	
37. Equipment Damage		This Consist		\$530,742.00		38. Track, Signal, Way, & Structure Damage		\$793,837.00	
								39. Primary Cause Code E23C	
								40. Contributing Cause Code N/A	
Number of Crew Members					Length of Time on Duty				
41. Engineer/Operators 1		42. Firemen 0		43. Conductors 1		44. Brakemen 0		45. Engineer/Operator Hrs 2 Mi 35	
46. Conductor Hrs 2 Mi 35									
Casualties to:		47. Railroad Employees		48. Train Passengers		49. Other		50. EOT Device? 1. Yes 2. No   1	
Fatal		0		0		0		51. Was EOT Device Properly Armed? 1. Yes 2. No   N/A	
Nonfatal		0		0		0		52. Caboose Occupied by Crew? 1. Yes 2. No   N/A	
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 1	
								54. Was Equipment Attended? 1. Yes 2. No   1	
								55. Train Number/Symbol 487-01	
56. Speed (recorded speed, if available) Code R - Recorded E - Estimated 0 MPH   E			58. 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				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 # <u>HQ-2009-55</u>	
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 1. Gates 4. Wig Wags 7. Crossbucks 10. Flagged by crew Crossing 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (spec. in narr.) Warning 3. Standard FLS 6. Audible 9. Watchman 12. None				116. Signaled Crossing (See instructions for codes)		117. Whistle Ban	
Code(s)				N/A		Code 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	
120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown				Code N/A		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	
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		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 3. Passing Train 5. Vegetation 7. Other (specify in narrative) 2. Standing Railroad Equipment 4. Topography 6. Highway Vehicle 8. Not obstructed			
Casualties to:		Killed		Injured		127. Driver 1. Killed 2. Injured 3. Uninjured	
128. Was Driver in the Vehicle? 1. Yes 2. No		Code N/A		Code N/A		Code N/A	
129. Highway-Rail Crossing Users		N/A		N/A		130. Highway Vehicle Property Damage (est. dollar damage)	
131. Total Number of Highway-Rail Crossing Users (include driver)		N/A		N/A		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

On November 1, 2009, at 3:01 p.m. CDT, eastbound Canadian Pacific (CP) Train 298-29 derailed 14 loaded cars on the Union Pacific Railroad (UP) Milwaukee Subdivision Main Track # 1. CP Train 298-29 was operating from CP Main Track # 1 to UP Main Track # 1 and crossing over to UP Main Track # 2. CP Train 298-29 struck and derailed the last four cars of westbound CP Train 487-01 which was standing on UP Main Track # 1 and CP Main Track # 2. The derailment occurred at UP Milepost 17.5 in Northbrook, Illinois. The railroad timetable directions are west and east and geographic directions are north and south. Timetable directions are used throughout the body of this report. Approximately 1,280 feet of track was destroyed.

There was no release of hazardous materials and no evacuation ordered. The accident met the monetary threshold for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing. The results of the tests were negative for the crew members of both trains. One loaded freight car fell from the railroad overpass and came to rest on Shermer Avenue. This is not an Amtrak route. The estimated equipment damage for both CP trains was \$687,295. UP track and signal damage was estimated at \$256,952.

At the time of the accident, the weather was clear and 50 °F.

The probable cause of the derailment was a binding truck bolster which caused the train car wheels to climb over the inside turnout closure rail leading to UP Main Track # 1.

## 138. NARRATIVE

## CIRCUMSTANCES PRIOR TO THE ACCIDENT:

## CP TRAIN 298-29

The crew assigned to CP Train 298-29 consisted of an engineer and a conductor. The crew went on duty on November 1, 2009, at 6:30 a.m. CDT, at Portage, Wisconsin. Portage is the home terminal for both crew members. The crew received more than the required statutory off duty rest period of 10 hours prior to reporting for duty. The conductor was off duty for personal reasons over 300 hours and the engineer was off duty for 21 hours 40 minutes.

CP Train 298-29 consisted of two locomotives (CP 8575-lead and CP 8762) 100 loads, 25 empties, 7,641 feet in length, with 14,125 trailing tons. The train crew made a pickup at Muskego Yard in Milwaukee, Wisconsin. The cars that were added to the train received a Class 1 Air Brake Test and mechanical inspection at Muskego Yard. The destination of the train was the Belt Railway of Chicago's Clearing Yard in Bedford Park, Illinois. The crew took no exceptions to the handling of the train prior to the accident.

## CP TRAIN 487-01

CP Train 487-01 consisted of five locomotives (CP 5907-lead), five loads, 66 empties, was 4,545 feet in length, with 2,785 trailing tons. The train originated at Clearing Yard where it received a Class 1 Train Air Brake Test and a mechanical inspection. The intended destination of the train was St. Paul, Minnesota.

The train crew consisted of an engineer and a conductor. The crew went on duty on November 1, 2009, at 12:30 p.m. CDT, at Clearing Yard, which is an away from home terminal. The crew received more than the required statutory off duty rest period of 10 hours. Both the engineer and the conductor were off duty for 12 hours 31 minutes.

In the accident area, the track is tangent, elevated, with a slight descending grade. The method of operation

on the Milwaukee Subdivision is Centralized Traffic Control (CTC). The train was operating through a turnout and crossover with a permanent speed restriction of 25 mph. The engineer was seated at the controls on the right side of the locomotive. The conductor was seated in the conductor's seat on the left side of the locomotive. The locomotive was being operated with the short hood forward.

THE ACCIDENT:

CP Train 298-29 was operating on a clear signal indication as it approached the point of derailment (POD) at milepost 17.5. CP Train 298-01 had reached a maximum recorded speed of 23.5 mph when the train experienced an undesired emergency application of the train air brake system. The conductor walked back to investigate and discovered 18 rail cars derailed. One loaded hopper car rolled off the overpass and came to rest on Shermer Ave. Of the 18 derailed cars, 14 were covered hoppers loaded with wheat and four were empties from CP Train 487-01.

Flange marks for a distance of approximately 22 feet were evident on the inside closure rail. The POD was just north of the right hand floating heel block in the switch. The first car to derail was DME 488705 that was positioned as the 67th car in the train. The evidence suggests this car had a binding truck condition on the B-end of the car which allowed the wheels to climb the closure rail of the switch. As CP Train 298-29 operated through the turnout and crossover switches the derailling cars from CP Train 298 -29 struck and derailed the last four cars in standing CP Train 487-01.

The CP Officials conducted a Federal Railroad Administration Mandatory Post Accident Toxicology Testing on both crews.

ANALYSIS AND CONCLUSION:

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 of 0.05. At or below this baseline, we do 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 employees involved in this accident.

Conclusion: Fatigue

FRA concluded that fatigue was not probable for any of the crew members involved on either train.

Analysis: Locomotive engineer performance

Both trains were equipped with operating event recorders that were downloaded at the accident site by a CP Road Foreman. The relevant event recorder data was analyzed at the CP Bensenville Yard Office. The CP took no exception to the operation of either train. FRA analyzed the downloaded data from the event recorders with no exceptions noted.

Conclusion: Locomotive engineer performance

Locomotive engineer performance was not a contributing factor.

Analysis: Track

FRA inspected the track at Shermer Control Point 17.57. No track deficiencies were noted. FRA also observed the on board video recordings retrieved from lead locomotive CP 8575. The video did not show any abnormal conditions in the area of the derailment.

The Union Pacific's last required FRA track inspection was conducted on October 30, 2009, with no deficiencies noted. On July 14, 2009, an on-track UP track geometry survey was conducted with no FRA deficiencies recorded at the location of the derailment. On May 28, 2009, an ultra-sonic rail flaw test vehicle conducted a survey through the accident area. No deficiencies were noted in the accident area.

**Conclusion: Track**

FRA concluded that track was not a contributing factor.

**Analysis: Toxicological testing**

The accident met the criteria prescribed in 49 CFR Part 219 Subpart C Post Accident Toxicological Testing. The test results for both crews were negative.

**Conclusion: Toxicological testing**

Impairment of the crew was not a contributing factor.

**Analysis: mechanical**

Rail car DME 488705 was transported to the CP Bensenville Rail Yard and reassembled for a detailed inspection. The evidence indicates that the B-end car body center plate was in contact with the truck bolster bowl. A vertical spacer ring made of stainless steel had been previously welded to take up excessive lateral movement in the bowl. This repair caused the ring to become the highest point on the bolster bowl. A straight edge was placed across the bowl to identify an approximate 1/8 inch ridge above the top portion of the center bolster well. This caused the weight of the loaded car to be transferred from a large surface area of the center of the bowl to the much smaller area of the ring. The top of the vertical spacer ring has a shine that matches the fresh wear marks on the car body.

The large surface area inside the bowl contained an amount of rust and dirt that indicated the absence of full contact of the center plate. The A-end of the rail car was also raised and it did not reveal the same type of wear on the center plate or bowl that had been found on the B-end. CP mechanical forces stated when they did install a vertical spacer ring they also installed a shim which would not allow the center plate to contact the vertical spacer ring. There was no evidence that there had been a shim in the bolster bowl. CP also could not identify where or when the vertical spacer ring had been installed in the bolster bowl of rail car DME 488705.

Two broken ride control springs inside the car body trucks were also discovered during the break down. A roller bearing adapter with a piece missing was discovered next to rail car DME 488705 where it came to rest at the derailment site. The adapter contained an excessive amount of rust at the point of the break indicating the deficiency existed for a considerable length of time.

**Conclusion: mechanical**

The truck condition indicated abnormal wear. The wear marks on the B-end center plate and the top of the bolster indicate interference of a proper rotation.

**PROBABLE CAUSE AND CONTRIBUTING FACTORS:**

The probable cause of the derailment was a binding truck bolster which caused the wheels to climb over the inside turnout closure rail leading to UP Main Track # 1.

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