



***Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch***

***Accident Investigation Report
HQ-2013-07***

***Canadian National – North America (CN)
Gary, IN
March 30, 2013***

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, 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.

TRAIN SUMMARY

1. Name of Railroad Operating Train #1 Canadian National - North America	1a. Alphabetic Code CN	1b. Railroad Accident/Incident No. 774903
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GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance Canadian National - North America	1a. Alphabetic Code CN	1b. Railroad Accident/Incident No. 774903
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 3/30/2013	4. Time of Accident/Incident 1:56 AM
5. Type of Accident/Incident Derailment		
6. Cars Carrying HAZMAT 36	7. HAZMAT Cars Damaged/Derailed 11	8. Cars Releasing HAZMAT 1
	9. People Evacuated 0	10. Subdivision Matteson
11. Nearest City/Town Gary	12. Milepost (to nearest tenth) 43.1	13. State Abbr. IN
		14. County LAKE
15. Temperature (F) 40 °F	16. Visibility Dark	17. Weather Clear
		18. Type of Track Yard
19. Track Name/Number South Hump Lead	20. FRA Track Class Freight Trains-25, Passenger Trains-30	21. Annual Track Density (gross tons in millions)
		22. Time Table Direction West

OPERATING TRAIN #1

1. Type of Equipment Consist: Yard/Switching				2. Was Equipment Attended? Yes		3. Train Number/Symbol YKHS04-29					
4. Speed (recorded speed, if available) R - Recorded E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 8195		6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter					Code 1	
6. Type of Territory Signalization: <u>Not Signaled</u> Method of Operation/Authority for Movement: <u>Other Than Main Track</u> Supplemental/Adjunct Codes: <u>N/A</u>											
7. Principal Car/Unit		a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.			Alcohol	Drugs		
(1) First Involved <i>(derailed, struck, etc.)</i>		UP 980433	43	no							
(2) Causing <i>(if mechanical, cause reported)</i>		0	0		9. Was this consist transporting passengers?				No		
10. Locomotive Units <i>(Exclude EMU, DMU, and Cab Car Locomotives.)</i>	a. Head End	Mid Train		Rear End		11. Cars <i>(Include EMU, DMU, and Cab Car Locomotives.)</i>	Loaded		Empty		
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	0	(1) Total in Equipment Consist	36	0	110	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	7	0	28	0	0
12. Equipment Damage This Consist 801765		13. Track, Signal, Way & Structure Damage 228380									
14. Primary Cause Code H704 - Switch previously run through											
15. Contributing Cause Code H199 - Employee physical condition, other (Provide detailed description in narrative)											
Number of Crew Members						Length of Time on Duty					
16. Engineers/Operators	17. Firemen		18. Conductors		19. Brakemen	20. Engineer/Operator			21. Conductor		
1	0		0		0	Hrs: 2	Mins: 56		Hrs: 0	Mins: 0	
Casualties to:	22. Railroad Employees		23. Train Passengers		24. Others	25. EOT Device?			26. Was EOT Device Properly Armed?		
Fatal	0		0		0	Yes			No		
Nonfatal	0		0		0	27. Caboose Occupied by Crew?					No
28. Latitude			29. Longitude								

CROSSING INFORMATION

Highway User Involved

Rail Equipment Involved

1. Type		5. Equipment	
2. Vehicle Speed (<i>est. mph at impact</i>)	3. Direction (<i>geographical</i>)	6. Position of Car Unit in Train	
4. Position of Involved Highway User		7. Circumstance	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? N/A		8b. Was there a hazardous materials release by N/A	
8c. State here the name and quantity of the hazardous material released, if any.			
9. 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 (<i>spec. in narr.</i>) 3. Standard FLS 6. Audible 9. Watchman 12. None N/A		10. Signaled Crossing Warning	11. Roadway Conditions N/A
12. Location of Warning N/A		13. Crossing Warning Interconnected with Highway Signals N/A	14. Crossing Illuminated by Street Lights or Special Lights N/A
15. Highway User's Age	16. Highway User's Gender	17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train	18. Highway User
19. Driver Passed Standing Highway Vehicle		20. View of Track Obscured by (<i>primary obstruction</i>)	
Casualties to:	Killed	Injured	21. Driver was
23. Highway-Rail Crossing Users	0	0	22. Was Driver in the Vehicle?
24. Highway Vehicle Property Damage (<i>est. dollar damage</i>)		25. Total Number of Vehicle Occupants (<i>including driver</i>)	
26. Locomotive Auxiliary Lights? N/A		27. Locomotive Auxiliary Lights Operational? N/A	
28. Locomotive Headlight Illuminated? N/A		29. Locomotive Audible Warning Sounded? N/A	

SYNOPSIS

On March 30, 2013, at 1:56 a.m., c.d.t., westbound Canadian National Railroad (CN) Train YKHS04-29 (YKH) derailed 35 cars on the South Hump Lead in CN's Kirk Yard in Gary, Indiana. YKH consisted of two locomotives operating by Remote Control Locomotive (RCL), a Remote Control Operator (RCO), 36 loaded tank cars, and 110 empty mixed freight cars which were by operated by Remote Control Operator (RCO). Seven of the 36 loaded tank cars were derailed. Twenty-eight of the empty mixed freight cars were derailed.

One of the seven derailed tank cars lost approximately five gallons of product. The product was UN 1268, Class 3, Petroleum Distillates.

One of the derailed tank cars from YKH ruptured a Northern Indiana Public Service Company (NIPSCO) underground natural gas pipeline of 15 inches in diameter. The loss of gas from NIPSCO's pipeline was 3,232,851 standard cubic feet. The time of gas blowing was approximately from 2:30 a.m., until 9:30 a.m. Total cost of lost gas was \$17,284.57.

CN Train M39731-28 (M397) had arrived earlier from Battle Creek, Michigan. The crew of M397 put their cars away in Kirk Yard and moved their two locomotives to the round house.

The method of train operation in Kirk Yard at the time of the derailment was Remote Control Zone No. 2, (RCZ), CN Rule 1202, System Operating Bulletin No. 23, dated March 21, 2013.

There were no injuries and no evacuation. The Gary Fire Department, U.S. Steel's Emergency Services, and the Lake County, Indiana, Haz-mat team leader responded to the accident.

The derailment temporarily closed five railroads, CSX Transportation, Norfolk Southern Corporation, Chicago South Shore and South Bend, Northern Indiana Commuter Transit District (NICTD), and Amtrak. Amtrak Train 30 was held for 2 hours and 40 minutes and Amtrak Train 48 was held for 1 hour and 30 minutes. NICTD commuter service was stopped for six hours. All the railroads began operations at approximately 9:40 a.m.

The weather was clear, dark, and 40 °F.

CN's equipment damage was \$801,765 and their track damage was \$228,380.

The probable cause of the derailment was the failure of the conductor of M397 to restore a switch.

Contributing Factor: Fatigue was probable for one or more of the employees, and the employee or employees may have been working at a diminished level of safety (effectiveness) due to mental and/or physical attributes associated with fatigue; which may have contributed to the cause of the accident/incident.

NARRATIVE

Synopsis Of The Accident

M397

The crew of M397 consisted of a locomotive engineer and a conductor. The conductor and engineer reported for duty at 3:30 p. m., e.d.t., March 29, 2013, at CN's Battle Creek Yard in Battle Creek, Michigan. Both crew members of M397 were off duty for 19 hours and 32 minutes prior to this assignment.

The crew of M397 had a job briefing at Battle Creek Yard. M397 consisted of two locomotives, 88 cars, eight empties, 5,205 tons, and 6,117 feet. The conductor said their trip from Battle Creek Yard to Kirk Yard was uneventful with no en-route work. The conductor said the weather was dark and cloudy.

The crew of M397 yarded their train in Kirk Yard Track No. 5 South, and uncoupled their locomotives from the train. They called the East End Coordinator (EEC) for a route to the round house. The EEC instructed M397's crew to contact the RCO and get permission from the RCO to occupy RCZ No. 2 and cross over from the Dixie Track at Broadway to the South Hump Lead.

M397's crew called the RCO and received permission to occupy the RCZ No. 2. They were instructed to realign all switches for hump operations on the South Hump Lead after their move was complete.

The conductor of M397 said when he completed his movement, he called the RCO and reported clear of RCZ No. 2 with all switches aligned for the CN 6001's movement.

YKH

The RCO had allowed M397 to occupy and crossover to the North Hump Lead. The RCO told the conductor of M397 to realign the switches at Broadway for humping operations of the South Hump Lead. The M397 conductor repeated that the switches were properly restored for the South Hump Lead.

The Accident:

The RCO pulled eastward on Track No. 1 South with 146 cars though the new connection to the South Hump Lead. He started his shove westward to the top of the hump and reached a maximum speed of seven mph. The CN rule that governs yard speed is Rule 520. The RCO was at the bottom of the hill waiting for the eastward locomotive and the train cars. He noticed that his speed dropped to four mph and then zero. His operator control unit (OCU) showed that his locomotive was in the 8th notch. He informed the yardmaster of the problem with the OCU and reported the derailed cars.

Analysis and Conclusions:

Post-Accident Toxicology Testing.

The RCO of YKH was tested under railroad authority.

Conclusion:

Intoxication or impairment was not a causal factor.

Analysis:

Fatigue analysis of train crew members: 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, 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 history, for three employees involved in this accident, including the crew of M397, and the RCO of YKH.

1. Locomotive engineer assigned to M397

Sleep setting: Excellent

Overall effectiveness = 70.77%

Lapse Index = 4.9

Reaction Time = 141%

Chronic Sleep Debt = 7.92

Hours of Continuous Wakefulness = 19.45

Time of Day (military) 00:25

BAC Equivalent = >0.05

Conclusion: Fatigue was probable for this employee.

2. Conductor assigned to M397

Sleep setting: Excellent

Overall effectiveness = 76.47

Lapse Index = 3.8

Reaction Time = 131%

Chronic Sleep Debt = 8.78

Hours of Continuous Wakefulness = 19.43

Time of Day (military) 00:25

BAC Equivalent = >0.05

Conclusion: Fatigue was probable for this employee.

3. Remote Control Operator assigned to YKH

Sleep setting: Excellent

Overall effectiveness = 69.66%

Lapse Index = 5.3

Reaction Time = 144%

Chronic Sleep Debt = 10.87

Hours of Continuous Wakefulness = 18.43

Time of Day (military) 00:25

BAC Equivalent = >0.08

Conclusion: Fatigue was probable for this employee.

Conclusion: Upon analysis of that information FRA concluded that fatigue was probable for one or more the employees, and the employee or employees may have been working at a diminished level of safety (effectiveness) due to mental and/or physical attributes associated with fatigue; which may have contributed to the cause of the accident/incident.

accident/incident.

Overall Conclusion:

The RCO had allowed M397 to occupy and crossover to the North Hump Lead and told the conductor of M397 to realign the switches after he finished his move. The conductor failed to line the crossover switch back after his movement which resulted in the derailment.

Probable cause:

The probable cause of the derailment was the failure of the conductor of M397 to restore a switch.

Contributing Factor: Fatigue was probable for one or more of the employees, and the employee or employees may have been working at a diminished level of safety (effectiveness) due to mental and/or physical attributes associated with fatigue; which may have contributed to the cause of the accident/incident.

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