Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2014-6

Western Fuels Association, Inc. (WFA)
San Mateo, NM
May 29, 2014

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.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2014-6

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Western Fuels Association, Inc. [WFA]	WFA	WFA002
2. Name of Railroad Operating Train #2	**2a. Alphabetic Code**	**2b. Railroad Accident/Incident No.**
Western Fuels Association, Inc. [WFA]	WFA	WFA002

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Western Fuels Association, Inc. [WFA]	WFA	WFA002
2. U.S. DOT Grade Crossing Identification Number	**3. Date of Accident/Incident**	**4. Time of Accident/Incident**
	5/29/2014	1:00 PM

5. Type of Accident/Incident
Obstruction

6. Cars Carrying HAZMAT	7. HAZMAT Cars Damaged/Derailed	8. Cars Releasing HAZMAT	9. People Evacuated	10. Subdivision
0	0	0	0	Lee Ranch Sub

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
San Mateo	17.2	NM	MCKINLEY

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
78 ˚F	Day	Clear	Siding

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Ambrosia Siding	Freight Trains-60, Passenger Trains-80	8.52	West

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	WFA 603

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross exluding power units)	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
42 MPH	R	6676		0

6. Type of Territory

Signalization:

Not Signaled

Method of Operation/Authority for Movement:

Other Than Main Track

Supplemental/Adjunct Codes:

Z

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 *(derailed, struck, etc.)*	WFA 603	1	yes		0	0
(2) Causing *(if mechanical, cause reported)*	WFA 603	1	yes	9. Was this consist transporting passengers?		No

10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End e. Remote	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	3	0	0	0	0	(1) Total in Equipment Consist	52	0	0	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
15000	2500

14. Primary Cause Code

H702 - Switch improperly lined

15. Contributing Cause Code

H305 - Instruction to train/yard crew improper

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	1	0	Hrs: 7 Mins: 0	Hrs: 7 Mins: 0

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others	25. EOT Device?	26. Was EOT Device Properly Armed?	27. Caboose Occupied by Crew?
Fatal	0	0	0	Yes	Yes	N/A
Nonfatal	0	0	0			

28. Latitude	29. Longitude
35.000000000	-108.000000000

U.S. Department of Transportation
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FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2014-6

OPERATING TRAIN #2

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Cut of Cars	No	MOW

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross exluding power units)	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
0 MPH	E			0

6. Type of Territory

Signalization:

Not Signaled

Method of Operation/Authority for Movement:

Supplemental/Adjunct Codes:

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 *(derailed, struck, etc.)*	Canron Mark I JR	0	no		0	0
(2) Causing *(if mechanical, cause reported)*	Canron Mark I JR	0	no	9. Was this consist transporting passengers?		No

10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End e. Remote	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	0	13	0	0	0	(1) Total in Equipment Consist	0	0	13	0	0
(2) Total Derailed	0	13	0	0	0	(2) Total Derailed	0	0	13	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
91000	2500

14. Primary Cause Code

H702 - Switch improperly lined

15. Contributing Cause Code

H305 - Instruction to train/yard crew improper

Number of Crew Members				Length of Time on Duty	
16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen	20. Engineer/Operator	21. Conductor
0	0	0	0	Hrs: 0 Mins: 0	Hrs: 0 Mins: 0

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others	25. EOT Device?	26. Was EOT Device Properly Armed?
				No	N/A
Fatal	0	0	0	27. Caboose Occupied by Crew?	
Nonfatal	0	0	0		N/A

28. Latitude	29. Longitude
35.000000000	-108.000000000

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CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved
1. Type		5. Equipment
2. Vehicle Speed *(est. mph at impact)*	3. Direction *(geographical)*	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	10. Signaled Crossing Warning	11. Roadway Conditions
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 N/A		N/A

12. Location of Warning	13. Crossing Warning Interconnected with Highway Signals	14. Crossing Illuminated by Street Lights or Special Lights
N/A	N/A	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 *(primary obstruction)*

Casualties to:	Killed	Injured	21. Driver was	22. Was Driver in the Vehicle?
23. Highway-Rail Crossing Users	0	0	24. Highway Vehicle Property Damage *(est. dollar damage)*	25. Total Number of Vehicle Occupants *(including driver)*

26. Locomotive Auxiliary Lights?	27. Locomotive Auxiliary Lights Operational?
N/A	N/A
28. Locomotive Headlight Illuminated?	29. Locomotive Audible Warning Sounded?
N/A	N/A

10. Signaled Crossing Warning

1 - Provided minimum 20-second warning
2 - Alleged warning time greater than 60 seconds
3 - Alleged warning time less than 20 seconds
4 - Alleged no warning
5 - Confirmed warning time greater than 60 seconds
6 - Confirmed warning time less than 20 seconds
7 - Confirmed no warning
N/A - N/A

Explanation Code

A - Insulated rail vehicle
B - Storm/lightning damage
C - Vandalism
D - No power/batteries dead
E - Devices down for repair
F - Devices out of service
G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present
H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)
J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits
K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/ island circuit
L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction
M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed
N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach
O - Warning time less than 20 seconds attributed to violation of special train operating instructions
P - No warning attributed to signal systems failure to detect the train
R - Other cause(s). Explain in Narrative Description

SYNOPSIS

Synopsis of Accident

The connections between the three companies are as follows:

BNSF Railway (BNSF) leases the Lee Ranch Subdivision from West Baca, New Mexico (Milepost (MP) 0.0)) to Lee Ranch, New Mexico (MP 115.4) to the Western Fuels Association (WFA) and WFA contracts with Mountain States Contracting (MSC) for all of the WFA track maintenance work.

On May 29, 2014, at 1:00 p.m., MST, a westbound WFA loaded coal train, WFA 603, operating on the Lee Ranch Subdivision, entered Ambrosia Siding via the east switch at MP 17.2 and struck unattended maintenance of way (MOW) equipment standing in the siding. The closest city to the accident site is Gallup, New Mexico, which is approximately 24 miles to the southwest. Timetable direction for the accident is westward.

There were no rail cars, equipment, or locomotives derailed on the WFA 603 but 11 pieces of MOW equipment belonging to MSC were derailed and damaged. As a result of the impact, two cars at the west-end of Ambrosia Siding were shoved over a derail, causing them to derail. These cars remained upright. There were no fatalities or injuries, no release of hazardous materials, and no evacuation. The total monetary equipment damages were $106,000.00 and $2,500.00 to track. Train: $15,000.00, MOW Equipment: $91,000.00.

At the time of collision, it was daylight, the sky was clear, and the temperature was 78 degrees.

This segment of railroad is leased by WFA from BNSF and jointly operated. Trains are dispatched by BNSF Dispatcher 8, and Western Fuels Association maintains the track. This line segment is not an Amtrak route.

The cause of the collision was H702, "switch improperly lined." Contributing cause is H305, "use of switch, instructions to train/yard crew improper." Contributing factors are insufficient job briefings and training for Roadway Workers and Maintenance-of-Way employees.

NARRATIVE

Narrative

Circumstances Prior to the Accident

The crew on Train WFA 603 consisted of a locomotive engineer and a conductor. The train crew went on duty at 6:00 a.m., MST, on May 29, 2014, at Western Fuels Association's (WFA) power plant near Prewitt, New Mexico. Both crew members had their statutory off duty rest prior to reporting for their assignment.

Mountain State Contracting (MSC) is the maintenance-of-way (MOW) contractor hired by WFA to maintain the Lee Ranch Subdivision. MSC's crew consisted of Track Foreman 1 (the Employee in Charge, (EIC) of the Form B), Track Foreman 2, Track Foreman 3, and a Machine Operator. MSC's employees were on lunch break when they released the Form B to Train WFA 603, and none were near the track equipment at the time of the accident.

Train WFA 603 consisted of 3 locomotives and 52 empty cars at Prewitt. It was 2,966 feet long and weighed 6,676 tons. Train WFA 603 crew performed a Class 1 air brake Test at 7:10 a.m., at Prewitt. Train WFA 603 departed Prewitt, at 7:25 a.m. to the Lee Ranch Mine to be loaded with coal. The Lee Ranch Subdivision has a maximum authorized speed of 49 mph. The track approaching the collision location is generally downgrade for several miles east of MP 17.2 with a maximum grade of 1.82 percent from MP 18.7 to MP 18. There is a 2-degree left hand curve to the east of MP 17.2, and the tangent track approaching the east switch at Ambrosia Siding begins at approximately MP 17.3, one-tenth of a mile east. The railroad timetable direction is east/west as is the general geographic direction.

Train WFA 603 arrived at Lee Ranch at 9:05 a.m., the rail cars were loaded and the train departed at 11:56 a.m. Their assigned unit coal train consisted of 3 locomotives, 52 loaded coal cars, was 2,966 feet long and weighed 6,676 tons. At 12:03 p.m., train crew contacted BNSF Dispatcher 8 to get Track Warrant authority to proceed west. The Engineer was seated in the lead engine on north side and Conductor was on south side of cab. After the train crew received track warrant to proceed west, the Conductor contacted Track Foreman 1, Gang 216, who was the Roadway Worker in Charge, (RWIC), of the Form B restriction. The restriction was for the Lee Ranch Subdivision from MP 24.0 to MP 16.0, and it was in effect from 8:30 a.m. to 4:00 p.m., on May 29, 2014, on the main track. Train WFA 603 received instructions from Track Foreman 1 to proceed past the red flag located at MP 24.0 and proceed through the limits at maximum authorized speed 49 mph, sounding bells and whistle for men and equipment. On the approach to Ambrosia Siding, Train WFA 603 was traversing a 2-degree left hand curve on a descending grade of 1.17. Train WFA 603 entered tangent track 1,587 feet from the MOW equipment left standing in Ambrosia Siding. The Maximum authorized speed for the main track is 49 mph as designated on Western Fuels Association Timetable 9.

The Accident

After westbound Train WFA 603 train crew communicated to Track Foreman 1, the RWIC, that they were approaching form B limits located between MP.24 and MP.17, Track Foreman 1 RWIC instructed the Tie Crane Operator to get in the clear at the east-end of Ambrosia Siding. When the Tie Crane Operator was instructed to clear the main track for Train WFA 603 he was operating near the west-end of Ambrosia Siding. Upon receiving instructions to clear the main track, the Tie Crane Operator proceeded back to the east-end of Ambrosia Siding. Track Foreman 2 positioned at the east-end of Ambrosia Siding, operated the switch from main track to siding, to allow the Tie Crane Operator to enter the east-end of siding. As the Tie Crane Operator enters the east-end of the siding and clears the main track, Track Foreman 2 walks away and leaves the east switch unattended and lined for movement into the siding. Track Foreman 2 failed to line the east switch of Ambrosia Siding back to normal position (main track). After the Tie Crane Operator cleared the main track at the east-end of Ambrosia Siding, Track Foreman 1 authorized westbound Train WFA 603 to enter the limits between MP.24 and MP.17 at maximum authorized speed of 49 mph.

As Train WFA 603 was approaching the east-end of Ambrosia Siding, Track Foreman 3 asked Track Foreman 1 what position the east switch was in. Track Foreman 1 then ran across the main track at the west-end of Ambrosia Siding to get a better view of the east switch. Track Foreman 1 verified that the switch target at the east-end of Ambrosia Siding indicated that the switch was lined into the siding. Track Foreman 1 then runs across the main track to use the radio in the company truck to warn the approaching Train WFA 603 of the improperly lined switch at east-end of Ambrosia Siding, and to make an emergency brake application.

Train WFA 603 entered the east-end of Ambrosia Siding at 42 mph (recorded speed), striking 11 standing pieces of MOW equipment. Prior to entering the siding, the Locomotive Engineer made an emergency brake application 1,584 feet from the point of impact. The train came to rest 2,159 feet after the emergency brake application. Three locomotives and seven coal cars entered the siding. There were no locomotives or rail cars derailed on Train WFA 603. All 11 MOW machines were shoved and jackknifed off the track. Two cars at the west-end of Ambrosia Siding were shoved over a derail, causing them to derail. These cars remained upright. At the time of impact all MOW operators were physically off of their machines and on lunch break at the west-end of Ambrosia Siding.

There was no release of hazardous materials, and none of the train's cars were transporting hazardous materials. There were no personal injuries to train crew or to MOW employees. There were no local governmental emergency responders involved in the incident as this is a desolate and sparsely populated area.

Analysis and Conclusions

Analysis- Toxicological testing: This accident did not meet the criteria for Title 49 Code of Federal Regulations (CFR) Part 219, Subpart C, Post Accident Toxicological Testing. Western Fuels Association conducted a company drug test for the MOW employees and all tests were negative.

Conclusion: Drug or Alcohol use was not a factor.

Analysis – Engineer and Conductor certification: Engineer certification was issued on March 26, 2014. Conductor certification was issued on May 21, 2014.

Conclusion: Engineer and Conductor were qualified with proper certification.

Analysis - WFA Mechanical inspection: There was not a mechanical inspection conducted by the Federal Railroad Administration (FRA) of locomotives, trains cars, or MOW equipment. Daily locomotive inspection on Train WFA 603 for May 29, 2014, and May 30, 2014, did not indicate any defects.

Conclusion: Mechanical was not a factor.

Analysis – Track Structure: There was not a track inspection conducted by FRA of main track or siding. There were 18 track inspections performed by MSC between March 31, 2014, and May 28, 2014, with no defects found around the derailment area of Ambrosia Siding.

Conclusion: Track structure failure not a factor.

Analysis – Train Crew Operating Performance: The Locomotive Engineer and Conductor were operating within BNSF train handling airbrake rules. The lead locomotive was not equipped with a track imaging recorder.

Conclusion: Event recorder analysis on the lead locomotive of Train WFA 603 indicates proper train handling was followed as prescribed in BNSF airbrake and train handling rules. Speed of train was not a factor.

Analysis: Main Track Switch

The westbound Train WFA 603 train crew alerted the RWIC of the Form B, Track Foreman 1, that they were approaching his Form B limits located between MP 24 and MP 17. Track Foreman 1 then instructed the Tie Crane Operator working on the main track near the west-end of Ambrosia Siding to get in the clear at the east-end of Ambrosia Siding. The Tie Crane Operator travelled east on the main track to clear the east switch, and Track Foreman 2 operated the switch from the main track movement to a siding movement to allow the machine to enter the siding. After the tie crane entered and proceeded into the siding, Track Foreman 2 walked away from the switch without returning the switch to main track movement. Track Foreman 2 failed to return the east Ambrosia Siding switch to the normal position for main track movement, and left it lined for Ambrosia Siding. The Tie Crane Operator, believing that Track Foreman 2 would return the switch to the normal main track position, continued into Ambrosia Siding without waiting until the switch was returned to its normal position.

without waiting until the switch was returned to its normal position.

Track Foreman 2 alerted Track Foreman 1 that the tie crane entered the siding, and then Track Foreman Number 1 authorized Train WFA 603 to proceed through his Form B Limits at the maximum speed of 49 mph. As Train WFA 603 approached the east-end of Ambrosia Siding, Track Foreman 3 questioned Track Foreman Number 1 about the position of the east switch of Ambrosia Siding. Track Foreman Number 1 looked toward the east-end of the siding and noted that the switch target was showing lined for the siding and not for the main track. He then went to his truck to use the radio to contact Train WFA 603 to alert the Engineer that the switch at East Ambrosia Siding was lined for the siding instead of the main track, and to initiate an emergency brake application.

Conclusion: FRA determined that after lining the east switch at Ambrosia Siding for MOW equipment to enter the siding, Track Foreman 2 did not return the switch to the normal position for main track movement. Track Foreman 2 did not report the switch position to the RWIC, Track Foreman 1, as required under 49 CFR § 218.105. This is also required under the BNSF MOW Rules 8.2 and 8.3, along with BNSF Special Instructions.

Track Foreman 1 did not did not comply with BNSF MOW Rule 8.2 before authorizing Train WFA 603 to proceed through the Form B under his control. Track Foreman 1 failed to comply with the requirement of recording specific switch position information prior to Train WFA 603 entering the Form B. He should have entered specific information into a Switch Position Awareness Form as required. This information should have included the name and location of the switch, the time the switch was operated and restored to the main track, and the final position of the switch. Both Track Foreman 1 and Track Foreman 2 failed to conduct a proper job briefing, which would have included the improperly lined switch. This was a failure to comply with 49 CFR § 214.315.

Analysis-MOW Employee Qualifications: Upon review of the MSC employees' training and qualifications, it is evident that required compliance with 49 CFR Part 214, Railroad Workplace Safety, was not met. Specific training records did not exist for MSC's employees as is required by Part 214. No records of training existed as required for 49 CFR §§ 214.343, Training and qualifications-general; and 353, Training and qualifications of roadway workers who provide on-track safety for roadway work groups. No records of training existed, as required for § 218.95, Instruction, training, and examination (pertaining to Subpart F). The lack of training records indicates that MSC's employees involved in this accident had not received the required training necessary to perform their assigned tasks safely. The on-site failure to comply with § 214.315, Supervision and communication (pertaining to a job briefing), was a direct failure of MSC's employees to follow compliance requirements.

Track Foreman 1, the RWIC, was not qualified in accordance with 49 CFR § 214.343(b) based on his last record of training being on January 18, 2007, and he had no record of training from that date. MSC failed to provide training and qualification to meet compliance with 49 CFR § 214.343(d). MSC failed to provide records for compliance with 49 CFR § 214.319(a), Non-qualified roadway worker in charge of working limits. They also failed to provide records for 49 CFR § 218.95, Failure to have adequate records regarding instruction, training, and examination. Part 218 Subpart F.

Track Foreman 2, the Tie Gang Foreman, did not have qualifications in accordance with 49 CFR § 213.7(e), Designation of qualified persons to supervise certain renewals and inspect track, Title 49 CFR § 214.343(b), Failure to provide annual RWP, Title 49 CFR § 214.313(a), Railroad safety rules, Title 49 CFR § 218.95, and CFR Part 218, Subpart F.

Track Foreman 3 did not have qualifications in accordance with Title 49 CFR § 213.7(e), Title 49 CFR § 214.343(b), Failure to provide of annual training, Title 49 CFR § 218.95, Title 49 CFR Part 218, Subpart F and Title 49 CFR § 214.313(a).

Machine Operator (Tie Crane) did not have qualifications in accordance with 49 CFR § 214.341(b), Assignment of non-qualified employee to operate machine, Title 49 CFR §214.343(a), Failure to provide initial training, Title 49 CFR § 218.95, and CFR Part 218, Subpart F.

Conclusion: The MSC employees involved in this accident were not deemed qualified in accordance with pertinent requirements of 49 CFR Parts 214 and 218 as associated with this accident. The lack of required training records indicates that these MSC employees were not properly trained and, therefore, not working safely due to their lack of knowledge of FRA and railroad rules and regulations.

Analysis- Fatigue Analysis: 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 work history, for six employees involved in this accident including the engineer, conductor, roadway worker, gang foreman, track foreman, and track foreman.

Conclusion: FRA concluded fatigue was not probable for the Conductor and Engineer assigned to Train WFA 603, and for the four MOW contract employees of MSC. Information for these employees follows:

Fatigue Conclusions:

1. Conductor assigned to: Train WFA 603
Sleep setting = Excellent
Overall effectiveness = 92.05
Chronic Sleep Debt = 3.81
Hours of Continuous Wakefulness = 8.52
Time of Day = 13.00
BAC Equivalent = <0.05
Conclusion: Fatigue was not probable for this employee.

2. Engineer assigned to: Train WFA 603
Sleep setting = Excellent
Overall effectiveness = 91.98
Chronic Sleep Debt = 3.83
Hours of Continuous Wakefulness = 8.52
Time of Day = 13.00
BAC Equivalent = <0.05
Conclusion: Fatigue was not probable for this employee.

3. Roadway Worker (Track Foreman 1)
Sleep setting = Excellent
Overall effectiveness = 93.71
Chronic Sleep Debt = 3.22
Hours of Continuous Wakefulness = 8.02
Time of Day = 13.00
BAC Equivalent = <0.05
Conclusion: Fatigue was not probable for this employee.

4. Roadway Worker (Track Foreman 2)
Sleep setting = Excellent
Overall effectiveness = 93.65
Chronic Sleep Debt = 3.23
Hours of Continuous Wakefulness = 8.02
Time of Day = 13.00
BAC Equivalent = <0.05
Conclusion: Fatigue was not probable for this employee.

5. Roadway Worker (Track Foreman 3)
Sleep setting = Excellent
Overall effectiveness = 93.72

Overall effectiveness = 93.72
Chronic Sleep Debt = 3.22
Hours of Continuous Wakefulness = 8.02
Time of Day = 13.00
BAC Equivalent = <0.05
Conclusion: Fatigue was not probable for this employee.

6. Roadway Worker (Tie Crane Operator)
Sleep setting = Excellent
Overall effectiveness = 93.55
Overall effectiveness = 93.55
Chronic Sleep Debt = 3.36
Hours of Continuous Wakefulness = 8.02
Time of Day = 13.00
BAC Equivalent = <0.05
Conclusion: Fatigue was not probable for this employee.

Overall Conclusion:

The cause of the collision was H702, "switch improperly lined."

Probable Cause and Contributing Factors:

The contributing cause can be attributed to H305, “use of switch, instructions to train/yard crew improper.” Contributing factors are insufficient job briefings and training for Roadway Workers and Maintenance-of-Way employees.

MSC employees left main track switch at the east-end of Ambrosia Siding lined improperly for movement into the siding. MSC’s RWIC improperly cleared Train WFA 603 through his Form B limits without verifying that the switch had been lined for main track movement. WFA’s MOW contractor, MSC, failed to conduct training and qualification requirements for their employees to meet the criteria of Parts 213; 214; and 218, Subpart F. These employees failed to have a proper job briefing to verify the position of the east Ambrosia Siding switch prior to the RWIC giving Train WFA 603 permission to proceed through their limits at maximum authorize speed.

The Roadway Worker failed to have job briefing about the position of a main track switch with roadway worker in charge, and the switch was left unlocked, unattended, and not restored to normal position. Roadway worker released the track limits without making that verification. MSC failed to properly train and qualify their employees on Parts 213; 214; and 218, Subpart F of the Federal regulations.