Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2017-1232

BNSF Railway Company (BNSF)
Williston, ND
October 13, 2017

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.

SYNOPSIS

On October 13, 2017, at approximately 5:00 p.m. MDT, a single rail car rolling uncontrolled impacted a BNSF Railway Company (BNSF) “road switcher” Freight Train R-MON8151-13I (train 1) as the train was traversing from the Red River Industries' track onto BNSF's Main Track No. 2. The side collision occurred at milepost 118.9 on the BNSF's Glasgow Subdivision, of the BNSF's Montana Division, near the city of Williston, North Dakota. Upon impacting the side of train 1, the striking rail car, RBOX 37478, derailed to the north causing a raking collision with the side of an eastbound BNSF Empty Grain Train, Train X-KALULE9-12H (train 2), which was passing by on Main Track No. 1. The side collision and subsequent raking collision resulted in the derailment of 10 cars (1 loaded, 9 empties) from train 1 and 32 cars from train 2. At the time of the accident, train 1 consisted of 2 locomotives on the head end, 19 empty rail cars, and 4 loaded rail cars, with 1,215 trailing tons. The train was traveling eastward, at an estimated speed of 5 mph when it was impacted by the unattended rail car (RBOX 37478). Train 2 consisted of three leading locomotives and 110 empty grain cars, with 3,413 trailing tons, and a length of 6,666 feet. Train 2 was traveling eastward on Main Track No. 1 at a recorded speed of 47 mph.

The method of operations on the Glasgow Subdivision is by signal indications of a Traffic Control System (TCS), controlled by a BNSF dispatcher located in BNSF's Dispatching Center in Fort Worth, Texas, and supplemented by the overlay of an operational Positive Train Control (PTC) system.

The railroad reported $300,529 in equipment damage to train 1, $1,248,983 in equipment damage to train 2, and $982,030 in track, signal, way and structure damages, for a total of $2,531,542 in reported damages. There were no injuries, no hazardous materials spill, and no evacuations resulting from this accident/incident. The Glasgow Subdivision is an Amtrak route, and there were Amtrak delays associated with this accident.

The weather at the time of the accident was 46° F with wind out of the NE at 20 mph.

The Federal Railroad Administration (FRA) determined that the probable cause of this accident/incident was failure to apply hand brakes on car(s) (railroad employee) (H021). No contributing causes were noted during the investigation.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2017-1232

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
BNSF Railway Company	BNSF	MT-1017-101
2. Name of Railroad Operating Train #2	2a. Alphabetic Code	2b. Railroad Accident/Incident No.
BNSF Railway Company	BNSF	MT-1017-101

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
BNSF Railway Company	BNSF	MT-1017-101
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	10/13/2017	5:00 PM

5. Type of Accident/Incident
Side Collision

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

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Williston	118.90	ND	WILLIAMS

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
46 ˚F	Dusk	Cloudy	Main

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Main 2 Track	Freight Trains-60, Passenger Trains-80	76.23	East

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

FRA File #HQ-2017-1232

OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	R MON8151 13I

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross excluding 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
5.0 MPH	E	1215		0

6. Type of Territory

Signalization:
Signaled

Method of Operation/Authority for Movement:
Signal Indication

Supplemental/Adjunct Codes:
Q

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.)*	RBOX37478	25	yes		0	0
(2) Causing *(if mechanical, cause reported)*	NA	0		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	2	0	0	0	0	(1) Total in Equipment Consist	4	0	19	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	1	0	9	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
300529	0

14. Primary Cause Code
H021 - Failure to apply hand brakes on car(s) (railroad employee)

15. Contributing Cause Code
N/A - N/A

Number of Crew Members

16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen
1	0	1	1

Length of Time on Duty

20. Engineer/Operator	21. Conductor
Hrs: 11 Mins: 0	Hrs: 11 Mins: 0

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others
Fatal	0	0	0
Nonfatal	0	0	0

25. EOT Device?	26. Was EOT Device Properly Armed?
No	N/A

27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
48.150048000	-103.576409000

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

FRA File #HQ-2017-1232

OPERATING TRAIN #2

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	X KALULE9 12H

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross excluding 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
47.0 MPH	R	3413		0

6. Type of Territory

Signalization:
Signaled

Method of Operation/Authority for Movement:
Signal Indication

Supplemental/Adjunct Codes:
Q

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.)*	BNSF 476611	47	no		0	0
(2) Causing *(if mechanical, cause reported)*	NA	0		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	0	0	110	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	32	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
1248983	982030

14. Primary Cause Code
H021 - Failure to apply hand brakes on car(s) (railroad employee)

15. Contributing Cause Code
N/A - N/A

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: 9 Mins: 45	Hrs: 9 Mins: 45

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others
Fatal	0	0	0
Nonfatal	0	0	0

25. EOT Device?	26. Was EOT Device Properly Armed?
Yes	Yes

27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
48.150048000	-103.576409000

SKETCHES

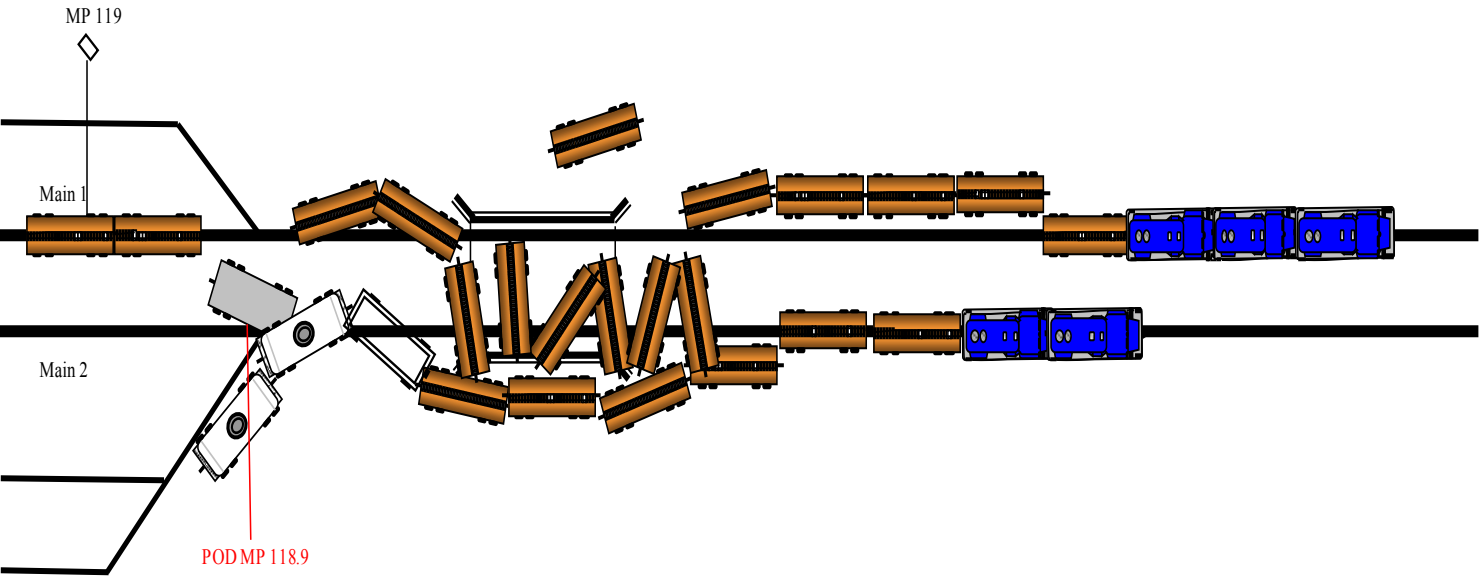
HQ-2017-1232 Sketch

BNSF X KALULE9-12H was proceeding east on Main Track #1 at 47 mph when a railcar derailed on Main Track #2 causing a raking collision. 32 of the 110 empty grain cars derailed.

HQ-2017-1232

N
W E
S

Not to Scale



Track Information:

- FRA Class 4 Main Track

Max authorized speed 55mph

- .60 grade descending east
- 76.23 Annual main line tonnage
- Tangent main line track
- FRA Class 1 Industry Track

Max authorized speed Industry 10mph

- POD at milepost 118.9

BNSF R MON8151 13I was travelling eastward at 5 mph on Main Track #2 through the industry turnout after switching cars in the industry. RBOX37478 railcar had been cut out and left unsecured on Main Track #2 near milepost 119 and rolled eastward side impacting the R MON8151 13I as it moved eastward through the turnout. 9 of the 19 cars derailed.

To: Williston, ND
RR West

To: Minot, ND
RR East

NARRATIVE

Circumstances Prior to Accident

Train R-MON8151-13I:

On October 13, 2017, at 6 a.m. MDT, the BNSF Railway Company (BNSF) Train R-MON8151-13I (train 1) crew consisting of an engineer, conductor, and brakeman reported for their assigned duty at BNSF's Williston, North Dakota, yard office. The crew had received a statutory off-duty (rest) period prior to reporting for duty. The crew job briefed and decided that they would use radio communications for all switching moves that day. They began the day by reviewing their paperwork and performing some unfinished work at an industry north of the main tracks near the Williston yard office. After completing the previous day's work, they went into the yard office and gathered paperwork required for the remainder of their day. Next, they went to the Williston yard and began switching cars to make up the train for their afternoon work. The crew built the train on a yard track and cut air into the air brake system before going on lunch break. When the crew returned from their lunch break they performed a transfer air brake test and departed the yard traveling east on Main Track No. 2.

Train 1 stopped approximately two miles east of the Williston yard to switch cars at Red River Industries, at milepost 119.2. The crew cut off the rear five cars from their train and left them standing on Main Track No. 2 between the east and west industry switches. Then they took the remaining cars with them into the industry track to pull cars scheduled to be pulled from the industry. After the crew coupled to the cars in the industry track, they cut the air into those cars. The crew stated that they then performed an air brake test before proceeding to pull out of the industry track. After pulling out of the industry track and onto Main Track No. 2, they lined the main track switch to the normal position and shoved back against the cars they had left standing on Main Track No. 2. Once they had coupled to these cars they cut the air into these cars as well. The conductor then instructed the engineer to pull the train ahead approximately four car lengths before instructing him to stop. The conductor requested and received set and centered protection from the engineer, then went in-between the equipment and closed the angle cock on the rear end of the second from the rear car. He pulled the pin lifter and left the rear car, RBOX 37478, on Main Track No. 2, west of the east industry switch. He then instructed the engineer to take the cars ahead to clear the switch. After moving a short distance, he instructed the engineer to stop. The engineer began to stop the movement and the conductor came back on the radio and instructed the engineer to keep going. The conductor stated over the radio that he didn't think the car (RBOX 37478) was going to set-up (apply its air brakes). The conductor stated in the interview that afterward, the car did stop. The conductor then relinquished control of the movement to the brakeman. The brakeman took control of the movement and began giving car counts to the engineer. He had the engineer stop their train clear of the east industry switch; he then operated the switch to the reverse position in order to line their train into the industry track. Once he had lined the switch, he instructed the engineer to start backing up their train. He then relinquished control of the movement back to the conductor who then spotted the rear five cars of their train in the proper location. After cutting the rear five cars from their train, he then instructed the engineer to take the train ahead, at which time he handed control of the movement back to the

brakeman, who was still positioned by the east industry switch. The conductor then informed the crew that he was remaining in the industry track where he would be working on the standing cut of cars in the industry applying hand brakes.

After taking control of the train's movement, the brakeman began counting down the number of car lengths the engineer needed to pull their train to be clear of the industry switch. The crew intended to clear the industry track, then proceed in a reverse move to the west, on Main Track No. 2, and re-couple to Car RBOX 37478.

Train X-KALULE9-12H:

On October 13, 2017, at approximately 7:15a.m., MDT, the BNSF Train X-KALULE9-12H (train 2) crew consisting of an engineer and conductor reported for duty at BNSF's Glasgow, Montana, rail terminal. This was the home terminal for both crew members who had received a statutory off-duty (rest) period prior to reporting for duty. The crew was assigned to operate train 2, eastward to Minot, North Dakota, a distance of 278.2 miles. Train 2 was an empty grain train consisting of 3 locomotives and 110 empty grain cars, with 3,413 trailing tons and measuring 6,666 feet in total length.

Per interview statements the crew said that after reporting for duty, they performed a job briefing, and then went to their train. They further stated that all equipment was working as intended and the safety devices were all operational. The train had a Trip Optimizer (TO) system on it as well as Positive Train Control (PTC) overlay system. Both systems were utilized during the trip and functioned as intended.

The crew recalled traveling east on Main Track No. 1 and that the dispatcher had given them an Approach Medium signal at East Williston indicating they would be crossing over from Main Track No. 1 to Main Track No. 2 at milepost 117.7. The crew stated they experienced no train handling problems and the trip had been uneventful as they approached the location where the crew of train 1 was spotting cars at Red River Industries. The engineer and conductor were seated in their respective chairs, and they recalled seeing one yellow box car sitting by itself on Main Track No. 2 and the train 1 road switcher pulling cars from the industry track onto Main Track No. 2 as they passed by.

The method of operations on the Glasgow Subdivision is by signal indications of a Traffic Control System (TCS), controlled by a BNSF dispatcher located in BNSF's Dispatching Center in Fort Worth, Texas, and supplemented by the overlay of an operational Positive Train Control (PTC) system. Timetable direction on this subdivision is east, and will be used throughout this report.

The weather at the time of the accident was 46°F with wind out of the NE at 20 mph.

The Accident

Train R MON8151 13I:
The engineer was seated in the engineer's seat and the brakeman was standing near the industry switch

while the conductor was applying hand brakes to the cars they had spotted in the industry track. After spotting cars in the Red River Industries track, train 1 began to pull eastward from the industry with their 2 head-end locomotives and 18 rail cars onto Main Track No. 2 at an estimated speed of 5 mph. At this time the unattended rail car on Main Track No. 2, Car RBOX 37478, began free-rolling eastward and impacted the side of train 1 at the east industry switch (milepost 118.9) as they were pulling east through the switch onto Main Track No. 2. Upon impact, Car RBOX 37478 derailed to the north of Main Track No. 2 and fouled Main Track No. 1, striking train 2 as it was passing at a recorded speed of 47 mph. The unsecured car caused both trains to derail near the industry switch and at points further east including over a small bridge. Ten cars from train 1 derailed on or to the south of Main Track 2. Thirty-two cars from train 2 derailed with 8 cars in an accordion-style derailment to the south of Main Track No. 1 and onto Main Track No. 2, with the remaining 24 cars derailing on their sides to the north of Main Track No. 1.

The railroad reported $300,529 in equipment damage to train 1, $1,248,983 in equipment damage to train 2, and $982,030 in track, signal, way and structure damages, for a total of $2,531,542 in reported damages. There were no injuries, no hazardous materials spill, and no evacuations resulting from this accident/incident. The Glasgow Subdivision is an Amtrak route, and there were Amtrak delays associated with this accident.

Post-Accident Investigation

On October 13, 2017, the Federal Railroad Administration (FRA) began an investigation of this accident. FRA Region 8 management assigned a Track Safety Inspector as Investigator/Inspector-in-Charge (IIC) of this investigation. The IIC was assisted in this investigation by two FRA Motive Power and Equipment Safety Inspectors and two FRA Operating Practices Safety Inspectors. Upon commencing the investigation, FRA investigators inspected the accident site, including the track approaching and at the Point of Impact (POI) and the Point of Derailment (POD). FRA also conducted a detailed inspection of all the pertinent and associated equipment involved in the accident. After their on-site inspection and investigation, FRA Inspectors conducted interviews with the train crew members of both trains. FRA's inspectors requested all necessary records, forms and other documentation to conduct their final analysis and conclusions concerning the pertinent facts of this accident/incident. The following analysis and conclusions, as well as the probable cause and any possible contributing factors, represent the findings of FRA's investigation.

Analysis-FRA Post Accident Toxicological Testing: This accident met the criteria for FRA Post-Accident Toxicology Testing as required under Title 49 CFR, Part 219, Subpart C. All members of both trains were tested with negative test results.

Conclusion: FRA determined drugs and alcohol did not contribute to the cause or severity of this accident.

Analysis-Crew Fatigue: FRA performed a fatigue analysis using the Fatigue Avoidance Scheduling

Tool (FAST). FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis. At or above this baseline, FRA does not consider fatigue as probable for any employee. Inputs into the FAST software vary based on information obtained from each employee. FRA obtained fatigue-related information, including a 10-day work history, for both train crewmembers. Based on the results of the analysis, fatigue was not probable for any of the employees involved in the accident.

Conclusion: FRA determined fatigue did not contribute to the cause or severity of this accident.

Analysis-FRA Signal Investigation: FRA requested signal data log information for signal and control points in the immediate area of the accident/incident site. An FRA Signal and Train Control Safety Inspector reviewed the signal logs and information related to the signal system at the derailment site.

Conclusion: FRA determined the signal system did not contribute to the cause or severity of this accident.

Analysis-Track: FRA requested and received track inspection records, a copy of the last rail inspection, and geometry car test results. These records were reviewed and the track conditions at the accident/incident site were inspected west (in approach) and east (in advance) of the determined POD.

FRA investigated for two consecutive days beginning October 13, 2017, and continuing through Saturday, October 14, 2017. FRA ascertained the POD from the first incident marks on the rail. The track west of and leading up to the POD was inspected and measurements were made including track notes with no exceptions or non-complying conditions noted. The industry turnout on Main Track No. 2, at milepost 118.9 where the first incident occurred, was inspected with no exceptions or non-complying conditions noted. Track inspection records, rail detection records, and geometry car inspection reports were obtained and reviewed with no exceptions noted for track in the accident/incident area.

Main Track No. 1 and No. 2 at the accident site are FRA Class 4 tracks with a maximum authorized timetable speed of 55 mph for freight trains. The industry track and turnout on Main Track No. 2 at milepost 118.9 is FRA Class 1 track with a maximum authorized speed of 10 mph. Main Tracks No. 1 and No. 2 in the area leading up to and beyond the site of the accident/incident are tangent with a .6-degree descending grade to the east. No causal exceptions were noted during the track inspection and inspection records review.

Conclusion: FRA determined track conditions did not contribute to the cause or severity of this accident.

Analysis-Mechanical inspection of locomotives and derailed cars: FRA assigned two Motive Power and Equipment inspectors to the derailment investigation team. The two inspectors conducted a thorough and complete inspection of the leading locomotives for Trains R-MON8151-13I and X-KALULE9-12H, including an inspection of the handbrake on the first incident car, Car RBOX 37478.

No causal exceptions were noted during the mechanical inspection. The hand brake on Car RBOX

37478 set, released, and functioned as intended; however, due to the brake rigging being damaged during the derailment, it could not be verified that the handbrake applied the brake shoes against the car's wheels.

Conclusion: FRA determined the mechanical condition of equipment did not contribute to the cause or severity of this accident.

Analysis-Audio Recordings: FRA obtained and reviewed audio recordings of the radio channels used by both the road crews (channel 54) and road switch crews (channel 32). These two channels were being utilized by the crews of both trains.

FRA's review of the audio recordings helped to determine the time the incident occurred. The audio recording was also used to reference the amount of time the conductor on train 1 was in-between when cutting off Car RBOX 37478 from their train. Upon reviewing the audio recordings, FRA determined the conductor on train 1 was in-between cars for only five seconds when cutting off the rear rail car, RBOX 37478, on Main Track No. 2 and leaving it unattended. The handbrake for this car was at the opposite end of the car and therefore FRA concludes there was not enough time for the conductor to have closed the angle cock, applied the hand brake, and pulled the pin lifter within the five seconds he was in between the cars.

Conclusions: FRA determined the conductor of train 1 failed to properly secure RBOX 37478 when leaving it unattended.

Analysis-Locomotive Camera: The outward facing video from the lead locomotive of Train X-KALULE9-12H (train 2), Locomotive BNSF 8063, was obtained, viewed, and analyzed by FRA.

FRA was unable to determine any conclusive causal factors from the outward facing video as train 2 approached the derailment site.

Conclusion: FRA could not make any conclusions based on the outward facing video.

Analysis-Train handling, train crew compliance and train crew experience levels: FRA obtained the training records and certifications of all employees involved. Two FRA Operating Practices Safety Inspectors reviewed and analyzed this information.

FRA's investigation determined that in addition to the crew of train 1 failing to properly secure Car RBOX 37478, the crew failed to show proper train placement of their cars on the train list they provided to first responders. The cars they had just cut away from at the Red River Industries contained hazardous material, and they failed to notate these cars on their train list and also failed to provide that information to first responders on the scene.

Conclusions: FRA determined the crew of train 1 were in violation of BNSF operating rules.

Overall Conclusions: Upon reviewing the audio recordings, FRA determined the conductor of train 1 was in-between cars for only five seconds when cutting off the rear car (Car RBOX 37478) on Main Track No. 2 and leaving it unattended. The handbrake for this car was at the opposite end of the car and therefore FRA concluded there was not enough time for the conductor to have closed the angle cock, applied the hand brake, and pulled the pin lifter within the five seconds he was in between the cars. The crew's failure to secure this rail car caused the car to roll free, colliding with and derailing both trains.

Probable Cause: FRA determined that the probable cause of this accident was cause code H021 - Failure to apply hand brakes on car(s) (railroad employee).