Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2018-1266

BNSF Railway Company (BNSF)
Saginaw, Texas
Wednesday, May 2, 2018

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 May 2, 2018, at approximately 1:30 a.m., CDT, BNSF Railway (BNSF) derailed 18 railcars in the Saginaw, Texas Yard, at Milepost (MP) 351.4 on the Ft. Worth Subdivision.

The switch crew handling Y-FTW331-1-01A, consisting of 3 locomotives and 41 railcars, was performing switching operations in the BNSF's Saginaw Yard when 41 unsecured railcars rolled south out of the yard. The 41 railcars rolled south for 0.8 of a mile with 18 of the railcars derailing at a switch point derail. The 18 railcars were mixed freight. The 10th car, an empty bulkhead flatcar (DWC 627739), derailed and crossed U.S. Highway 287 Business striking a utility pole, cutting off power to the area.

Weather at the time of the accident was reported as 68° F, dark with light rain and light winds out of the southwest at 12-14 mph.

No employees, or civilians, were injured in the accident. Damage estimates from the accident totaled $453,479. Equipment damage was $418,479, and track and signal damage was $35,000.

The Federal Railroad Administration (FRA) determined the probable cause of the accident to be (H021) -- Failure to apply hand brakes on car(s) (railroad employee).

FRA determined a possible contributing factor of the accident to be H999 -- Other train operation/Human factors, due to the probable fatigue of the Brakeman.

FRA determined this accident was not PTC preventable.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2018-1266

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
BNSF Railway Company	BNSF	RD-0518-103

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	RD-0518-103

2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	5/2/2018	1:30 AM

5. Type of Accident/Incident
Derailment

6. Cars Carrying HAZMAT	7. HAZMAT Cars Damaged/Derailed	8. Cars Releasing HAZMAT	9. People Evacuated	10. Subdivision
18	0	0	0	FT WORTH

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Saginaw	351.4	TX	TARRANT

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
68 ˚F	Dark	Rain	Yard

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
8297	Freight Trains-10, Passenger Trains-15	48.28	North

23. PTC Preventable
No

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Yard/Switching	Yes	Y-FTW331-1-01A

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
10.0 MPH	E			0

6. Type of Territory

Signalization:
Not Signaled

Method of Operation/Authority for Movement:
Other Than Main Track

Supplemental/Adjunct Codes:
T

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.)*	BN 575509	1	no		0	0
(2) Causing *(if mechanical, cause reported)*				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	21	0	20	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	5	0	13	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
418479	35000

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

15. Contributing Cause Code
H999 - Other train operation/human factors (Provide detailed description in narrative)

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: 1 Mins: 59	Hrs: 1 Mins: 59

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?
N/A	N/A

27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
32.823419000	-97.354036000

Final Railcar Resting Position

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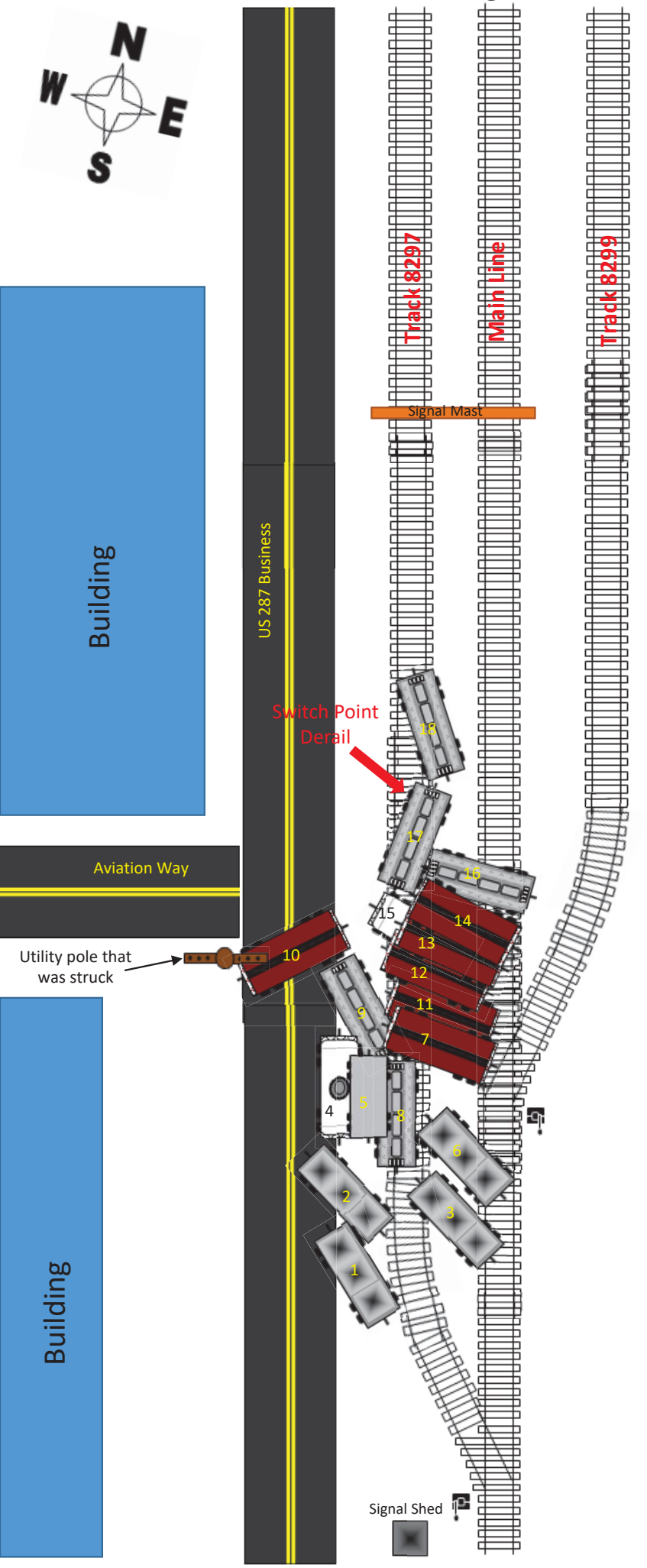

1 – BN 575509 On It's Side
2 – BN 954133 On It's Side
3 – BN 551423 On It's Side
4 – FHRX 649548 On It's Top
5 – BN 57556
6 – ATSF 85877
7 – ATSF 81786
8 – EQUX 620178 On It's Side
9 – EQUX 621478 On It's Side
10 – DWC 627739
11 – WC 37985
12 – LW 880071
13 – COER 875165
14 – TTZX 862468
15 – GATX 3930 On It's Side
16 – CITX 200391
17 – EQUX 13625
18 – CITX 200307

NARRATIVE

Circumstances Prior to the Accident

BNSF Railway's (BNSF) yard train Y-FTW331-1-01A (the train) was a yard switcher assigned to switch a cut of 41 mixed freight cars at North Yard in Fort Worth, Texas. Because the cars were being switched between yard tracks, no tests or inspections were required, and the air brakes on the cars were not in use. The train was not scheduled to depart the yard, and no end of train device (EOT) was being used. No special restrictions applied to the train.

The train crew consisted of an engineer, a conductor, and a brakeman. All three crew members were on duty at North Yard on May 1, 2018, at 11:31 p.m., CDT, and had received the statutory off-duty period prior to coming on duty. The Engineer was located at the controls of the lead locomotive, BNSF 1767. The Conductor was standing in the lead locomotive, and the Brakeman was on the ground between the rear locomotive and first car.

The accident occurred on the BNSF Red River Division, Fort Worth Subdivision, in Tarrant County, Saginaw, Texas. Timetable direction of North Yard is north. Timetable direction will be used throughout this report. Saginaw Yard is oriented roughly north to south-southeast with a typical classification yard layout. The primary switching lead is located on the west side of the yard. The trim end (south end) combines down into three tracks – BNSF Main, Yard 8297 (West Pass Lead), and 8299. The switching lead (west side) flows into track 8297 (west side of main) which flows into the BNSF main on the south end. Both track 8297 and 8298 have derails applied on the south end to protect the main track.

North Yard is non-signaled territory, and other than main track movement authority rules govern movement. The track through the accident area has a descending grade of about 1 percent between Milepost (MP) 352 and MP 350.73.

The train had completed a routine switching classification move and finished by placing 41 cars into yard track 8202. The helper uncoupled the railcars from the locomotives so they could continue to perform their switching duties. As the locomotives pulled away, the railcars began to roll south in track 8202 towards track 8297 and ultimately, the BNSF main.

The Accident

The Brakeman uncoupled the railcars from the locomotives, and the standing cars began to roll south in track 8202. After rolling out of track 8202, the 41 cars continued down the switching lead, and onto track 8297 (West Pass Lead). The cut of cars rolled about eight-tenths of a mile, reaching an estimated speed of 10 mph, before derailing on a split-rail derail at MP 351.4 at approximately 1:30 a.m.

Eighteen of the 41 rail cars derailed. Cars 1 through 3, 8, 9, and 15 derailed and rolled onto their side. Car four completely rolled over, resting on its top. Cars 5 through 7, 10 through 14, and 16 through 18 derailed and remained upright. Cars 19 through 41 did not derail.

Maximum authorized speed in the accident area is 10 mph as published in the BNSF Red River Division Timetable No. 2, effective April 25, 2018. The estimated speed of the roll-out was 10 mph at point of derailment.

There was a total of 18 hazardous material cars in the track, however none of the hazardous material cars derailed. No hazardous material was released in the accident.

There was no evacuation because of the accident, however, the 10th car derailed (DWC 627739) crossed U.S. Highway 287 Business (west side of yard) and struck a utility pole causing a disruption of power to a two-block radius. The area is an industrial complex with no family housing. Numerous businesses and Meacham Airfield were impacted by the outage. There was further impact to business due to clearing operations, which spanned on May 2, 2018, from 1:30 a.m. to 8:00 p.m.

No employees, or civilians, were injured in the accident. Damage estimates from the accident totaled $453,479. Equipment damage was $418,479, and track and signal damage was $35,000.

Weather at the time of the accident was reported as 68° F, dark with light rain and light winds out of the southwest at 12-14 mph.

Post-Accident Investigation

FRA looked at Signal & Train Control, Track, Mechanical and Operating practices. Track and signal components were quickly ruled out -- as the yard job was operating in other than main track territory with no signal application. Track 8297 at MP 351.4 was a passing track that ran parallel to the mainline track with a maximum speed of 10 mph. The mainline track runs on the east side of track 8297. The track through this area was tangent track with a 1 percent descending grade. The rail on track 8297 is a mix of 132 and 136 lbs., Continuous Welded Rail (CWR). A northward facing switch point derail is located at MP 351.4 that derails to the west. Track 8202 is a yard track that ran parallel to other yard tracks and joins track 8297 from the yard lead track. The yard track has a maximum speed of 10 mph. Track 8202 has a 1 percent descending grade on the south end of the yard. The rail on this track 8202 is a mix of 132 and 136 lbs. CWR. The 0.92-1 percent descending grade is identified on page 50 of the BNSF Track Chart Ft. Worth Subdivision, Gainesville, Texas to Temple, Texas, MP 411.3 to MP 218.

The mechanical foreman for the BNSF inspected the railcars at the derailment site and determined no hand brakes were set on any of the railcars involved in the incident.

The Engineer was hired April 4, 2005, and was last certified on February 24, 2016. There were no discipline remarks on file for the Engineer. The Switch Foreman was hired January 26, 2015, and completed his territorial rules examination on March 20, 2015. His Conductor on-the-job training was completed on April 24, 2015. The Switch Foreman showed discipline regarding "attendance". The Switch Helper was hired August 14, 2017, and completed his territorial rules examination on October 9, 2017. The Helper had no discipline entries on record. He completed his Conductor on-the job training

November 13, 2017. The Engineer was dual certified (Title 49 Code of Federal Regulations (CFR) Part 240 & 242) with a new hire date of April 4, 2005. Neither the Foreman nor the Helper had taken a certification examination for promotion to conductor.

All three crew members had been field tested (BNSF Operational Test #602) at least one time during the past six months. There was no indication on record of any issues with test compliance and no exceptions taken. Hours of Service records were requisitioned from BNSF for Fatigue Avoidance Analysis.

Crew interviews were not conducted due to pending BNSF investigations. The crew members did not wish to speak about the accident before the formal hearing was conducted.

Analysis and Conclusions

Analysis – Mechanical: A mechanical inspection of the cars determined there were no hand brakes applied to any of the 41 cars left in the track. The absence of a "sufficient number" of hand brakes allowed the cars to roll down the 1 percent descending grade, and out of track 8202. Prior to the cars rolling freely, the locomotives coupled to the 41 cars in track 8202 was sufficient to hold the cars. Once the locomotives were uncoupled, there was nothing to provide any retardation to prevent the cars from rolling. FRA did not find any mechanical condition present that would have prevented the application of hand brakes to the 41 cars.

Conclusions: FRA determined the mechanical condition of the cars did not contribute to the cause or severity of the accident.

Analysis – Toxicology: This accident did not meet the requirements for Title 49 CFR Part 219, Subpart C. BNSF did, however, conduct toxicological testing on all three crew members with negative results.

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

Analysis – Fatigue: The FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to a 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 based on the 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 locomotive engineer, conductor, and brakeman assigned to the train crew involved in the roll-out derailment.

FRA concluded fatigue was not probable for the Engineer or Conductor, but was probable for the Brakeman.

Conclusions: FRA determined that fatigue was likely for the Brakeman, and could be a contributing factor

in the accident.

Analysis – Operating Practices: The Engineer was hired April 4, 2005, and was last certified on February 24, 2016. There were no discipline remarks on file for the Engineer. The Switch Foreman was hired January 26, 2015, and completed his territorial rules examination on March 20, 2015. His Conductor On-the-Job training was completed on April 24, 2015. The Switch Foreman showed discipline regarding "attendance". The Switch Helper was hired August 14, 2017, and completed his territorial rules examination on October 9, 2017. The Helper had no discipline entries on record. He completed his Conductor on-the-job training November 13, 2017. The Engineer was dual certified (Title 49 CFR Part 240 and 242) with a new hire date of April 4, 2005. Neither the Foreman nor Helper had taken a certification examination for promotion to conductor.

The crew was in violation of the BNSF's General Code of Operating Rules - Rule 7.6, Securing Cars or Engines. FRA was not able to conduct interviews with any of the crew members due to their refusal pending investigation by BNSF.

Conclusions: FRA determined the crew did not comply with GCOR - Rule 7.6 – and, as such, was the probable cause of the accident.

Analysis – Railroad Operational Testing: All three crew members had been field tested (BNSF Operational Test #602) at least one time during the past six months. There was no indication on record of any issues with test compliance and no exceptions taken.

Conclusions: FRA determined the Railroad's Operational Testing did not contribute to the cause or severity of the accident.

Analysis – Signal System: The train was an assigned yard switcher, operating solely on other-than main track.

Conclusions: FRA determined the signal system did not contribute to the cause or severity of the derailment.

Analysis – Track: Track 8297 at MP 351.4 was a passing track that ran parallel to the mainline track with a maximum speed of 10 mph. The mainline track runs on the east side of track 8297. The track through this area was tangent track with a 1 percent descending grade. The rail on track 8297 is a mix of 132 and 136 lbs., Continuous Welded Rail (CWR). A northward facing switch point derail is located at MP 351.4 that derails to the west.

Track 8202 is a yard track that ran parallel to other yard tracks and joins track 8297 from the yard lead track. The yard track has a maximum speed of 10 mph. Track 8202 has a 1 percent descending grade on the south end of the yard. The rail on this track 8202 is a mix of 132 and 136 lbs. CWR.

Conclusions: FRA determined the track and track structure did not contribute to the cause or severity of the derailment.

Overall Conclusions

After analyzing the information provided for the derailment, it has been determined the cause of the incident is due to the negligence by the yard switch crew on the train. The yard switch crew failed to secure enough hand brakes for railcars to prevent movement on a yard track with a 1 percent descending grade. FAST Analysis of the Brakeman indicated fatigue was probable with a lapse index at 4.2 (this individual was 4.2 times more likely to suffer a lapse compared to a fully rested individual) which may have been a contributing factor in the accident.

Probable Cause and Contributing Factors

FRA determined the probable cause of the accident to be (H021) -- Failure to apply hand brakes on car(s) (railroad employee).

FRA determined a possible contributing factor of the accident to be H999 -- Other train operation/Human factors, due to the probable fatigue of the Brakeman.

FRA determined this accident was not PTC preventable.