



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

***Accident Investigation Report
HQ-2020-1397***

***BNSF Railway Company (BNSF) Derailment
Temple, Texas
September 6, 2020***

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 September 6, 2020, at approximately 12:37 a.m., CDT, a BNSF Railway Company (BNSF) southbound (timetable direction) unit sand train (U-OGISOX-0-02T), handling 105 loads, 0 empties with 3 locomotives (configured 2 x 1) at a recorded speed of 39 mph, derailed 26 cars at Milepost (MP) 211.0 on the Galveston Subdivision at Heidenheimer -- approximately 6.7 miles south of Temple, in Bell County, Texas.

The method of operation for the Galveston Subdivision (Red River Division) is Direct Traffic Control (CTC) with a maximum authorized speed of 55 mph – unless otherwise restricted -- per BNSF's Galveston Subdivision Timetable #3, effective April 22, 2020.

The derailment involved consist lines 62 and 67-91 (inclusive) or 26 cars with all the cars turned over or jackknifed.

There were no injuries to the crew or the public and no hazardous material involvement.

Weather at the time of the derailment was described as clear, dark, and 73°F.

This was not an Amtrak route and not PTC preventable.

Total estimated damages were \$3,206,712 (Track: \$475,000 / Equipment: \$2,731,712).

The Federal Railroad Administration (FRA) determined the probable cause to be T001 -- Roadbed settled or soft.

TRAIN SUMMARY

| | | |
|--|-----------------------------|---|
| 1. Name of Railroad Operating Train #1 BNSF Railway Company | 1a. Alphabetic Code BNSF | 1b. Railroad Accident/Incident No. RD-0920-106 |
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GENERAL INFORMATION

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|---|---|---|
| 1. Name of Railroad or Other Entity Responsible for Track Maintenance BNSF Railway Company | 1a. Alphabetic Code BNSF | 1b. Railroad Accident/Incident No. RD-920-106 |
| 2. U.S. DOT Grade Crossing Identification Number | 3. Date of Accident/Incident 9/6/2020 | 4. Time of Accident/Incident 12:37 AM |
| 5. Type of Accident/Incident Derailment | | |
| 6. Cars Carrying HAZMAT 0 | 7. HAZMAT Cars Damaged/Derailed 0 | 8. Cars Releasing HAZMAT 0 |
| 9. People Evacuated 0 | | |
| 10. Subdivision BNSF RAILWAY COMPANY - GALVESTON | | |
| 11. Nearest City/Town TEMPLE | 12. Milepost (to nearest tenth) 211 | 13. State Abbr. TX |
| 14. County BELL | | |
| 15. Temperature (F) 73 °F | 16. Visibility Dark | 17. Weather Clear |
| 18. Type of Track Main | | |
| 19. Track Name/Number SIMN | 20. FRA Track Class Freight Trains-60, Passenger Trains-80 | 21. Annual Track Density (gross tons in millions) 32.7 |
| 22. Time Table Direction South | | |
| 23. PTC Preventable No | 24. Primary Cause Code [T001] Roadbed settled or soft | 25. Contributing Cause Code(s) |

OPERATING TRAIN #1

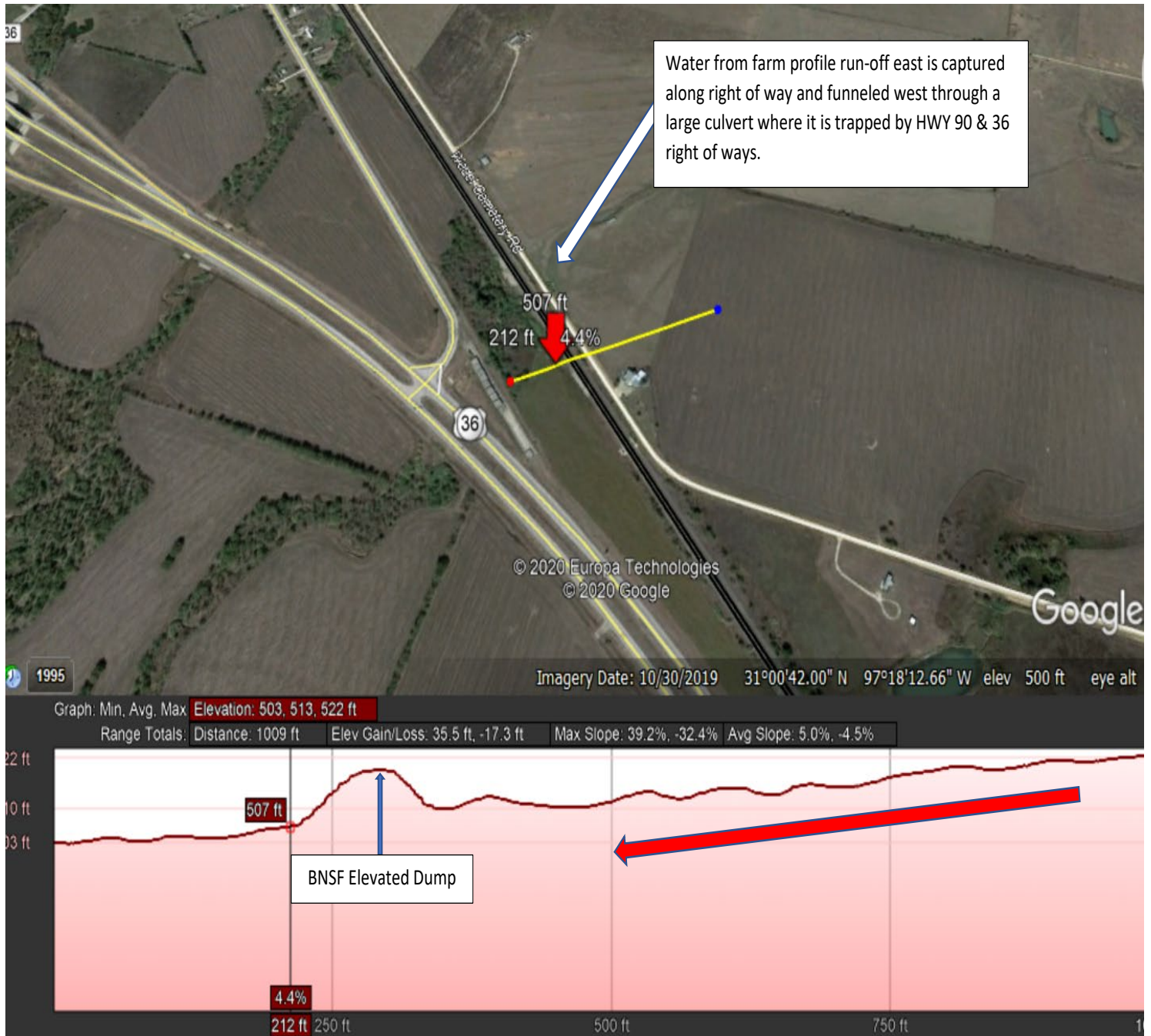
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|---|--|------------------------|---|--------------------------------|---|------------------------|--|--|--|---|-------|
| 1. Type of Equipment Consist: Freight Train | | | | | 2. Was Equipment Attended? Yes | | 3. Train Number/Symbol U-OGISOX-0-02T | | | | |
| 4. Speed (recorded speed, if available) R - Recorded 39.0 MPH E - Estimated | | Code R | 5. Trailing Tons (gross excluding power units) 14840 | | 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 | |
| 6. Type of Territory Signalization: <u>Signaled</u> Method of Operation/Authority for Movement: <u>Signal Indication</u> Supplemental/Adjunct Codes: <u>Q</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>) | | HWCX11076 | | 64 | | yes | | | | 0 | 0 |
| (2) Causing (<i>if mechanical, cause reported</i>) | | | | | | | | 9. Was this consist transporting passengers? | | No | |
| 10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.) | | | | | | | | | | | |
| 11. Cars (Include EMU, DMU, and Cab Car Locomotives.) | | | | | | | | | | | |
| 12. Equipment Damage This Consist 2731712 | | | | | | | | | | | |
| 13. Track, Signal, Way & Structure Damage 475000 | | | | | | | | | | | |
| Number of Crew Members | | | | | | Length of Time on Duty | | | | | |
| 14. Engineers/Operators 1 | | 15. Firemen 0 | | 16. Conductors 1 | | 17. Brakemen 0 | | 18. Engineer/Operator Hrs: 1 Mins: 7 | | 19. Conductor Hrs: 1 Mins: 7 | |
| Casualties to: | | 20. Railroad Employees | | 21. Train Passengers | | 22. Others | | 23. EOT Device? Yes | | 24. Was EOT Device Properly Armed? Yes | |
| Fatal | | 0 | | 0 | | 0 | | 25. Caboose Occupied by Crew? | | N/A | |
| Nonfatal | | 0 | | 0 | | 0 | | | | | |
| 26. Latitude 31.003134000 | | | | 27. Longitude -97.290319000 | | | | | | | |

SKETCHES

Sketch - Area Drainage Profile

Heidenheimer, TX Derailment Site – Drainage Profile 09282020

HQ-2020-1397



SKETCHES

Sketch - Drone Overview

U-OGISOX-0-02T Looking South



U-OGISOX-0-02T Looking North



NARRATIVE**Circumstances Prior to the Accident**

BNSF Railway (BNSF) unit sand train U-OGISOX-0-02T (Train 1), consisting of three locomotives configured 2 x 1 with two on the head end (BNSF 4040 and BNSF 4442) and one rear train distributive power unit (DPU) (BNSF 5871), was assembled in Oregon, Illinois, on September 3, 2020, and arrived in Temple, Texas, on September 5, 2020, at 10:39 p.m., CDT. Train 1 had 105 loads, 0 empties, was 4,404 feet long, and had 14,840 trailing tons. All required tests and inspections were completed at BNSF Temple Yard prior to departure, with no exceptions taken.

The crew of Train 1, consisting of an engineer and conductor, was placed on duty on September 5, 2020, at 11:30 p.m., CDT, at Temple. Temple was the home terminal for both employees, and both employees had received more than the statutorily required time off prior to being called for duty.

The Galveston Subdivision is dispatched by Centralized Traffic Control per the Galveston Subdivision Timetable No. 3 effective April 22, 2020 – with a maximum authorized speed of 55 mph for freight trains.

The maximum authorized speed for Train 1 was 55 mph – with a 40-mph slow order put in place on September 3, 2020, for 1 ¼ inch cross level near the point of derailment (POD) and an approach medium signal, located ahead at Milepost (MP) 211.1, restricting Train 1 speed to 40 mph until the next signal where multiple main track territory was reduced to single main at MP 206.2.

The Engineer was seated at the controls on the right side of the leading locomotive, and the Conductor was seated on the left side. The crew did not report any issues with the train prior to the derailment, and the train consist had not been changed.

At the time of the derailment it was dark, clear, and the temperature was 73°F.

The Accident

At approximately 12:37 a.m., CDT, on September 6, 2020, Train 1 was moving southbound on Main Track 1 at a recorded speed of 39 mph when it encountered poor track conditions at MP 211.0 due to subgrade failure. As cars traversed the track over the subgrade location, the west field side of the track collapsed causing cars 62 and 67-91 (inclusive) to derail in an accordion-fashion – fouling both main tracks.

The derailment occurred approximately 6.7 miles south of Temple, in Bell County, Texas.

No injuries happened to the crew or public and no hazardous materials were involved.

First responders included the FRA, Bell County Department of Emergency Management, and the Bell County Sheriff's Office.

BNSF reported damages of \$3,206,712, which included \$475,000 in track, and \$2,731,712 in equipment damages.

Post-Accident Investigation

The accident was investigated by the FRA in conjunction with the BNSF Railway Company.

The following analysis and conclusions represent a summary of the FRA investigation.

Analysis and Conclusions

Analysis - Toxicology: This accident met the minimum requirements for toxicological testing under Title 49 Code of Federal Regulations (CFR) Part 219. Toxicological testing was performed on both crew members of Train 1. FRA Post-Accident Forensic Toxicology Result Reports indicate the two employees each had negative test results.

Conclusion: FRA determined that neither drugs nor alcohol contributed to the cause or severity of the accident.

Analysis – Operating Practices: The Engineer had a service date of March 8, 2004, with BNSF and was promoted to train service as engineer on January 21, 2006. At the time of the accident, the Engineer held a Title 49 CFR Part 240 Engineer’s Certificate expiring January 24, 2021. He was last tested on BNSF rules on February 7, 2020. The record shows one discipline event on May 15, 2017, for attendance.

The Conductor had a service date of March 30, 2013, and was promoted to train service as a conductor on July 15, 2015. At the time of the accident, the conductor held a Part 242 Conductor’s Certificate expiring August 18, 2021. His last rules and physical characteristics exam was completed August 14, 2020. The conductor’s record showed discipline for rule violations for discipline and shove protection.

The FRA investigation determined none of the Engineer or Conductor’s prior discipline for rules violations demonstrated a pattern or identified a concern with the safety culture. Both employees were complying with all Federal regulations and carrier safety rules at the time of the accident.

The lead locomotive (BNSF 4040) was equipped with a speed indicator and an event recorder as required by Federal regulations. The relevant event recorder data was downloaded by BNSF and analyzed by FRA with no exceptions noted in train handling technique.

Conclusion: FRA determined that operating practices did not contribute to the cause or severity of the accident.

Analysis – Mechanical: The derailment involved the Lines 62 and 67-91 on the rear of the train. BNSF

records indicated the train underwent a Class I Initial Terminal Brake Test and Inspection in Oregon, Illinois, on September 3, 2020, and a required Class IA Brake Test - 1,000-mile inspection was performed in Kansas City, Kansas, on September 4, 2020, at 1:14 p.m., CDT – with no exceptions noted by the BNSF Mechanical Department on any of the derailed cars.

Post-accident inspections of Train 1 did not identify any defective mechanical condition.

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

Analysis – Track & Structures: This segment of track is multiple main track. The derailment occurred on Main Track No. 1, consisting of 136 lb. rail manufactured by Mittal Steel in April 2008. The rail was fastened to concrete crossties with rubber insulation pads and elastic fasteners. The ballast was made up of 1.5 to 2.75-inch clean rock.

Prior to the derailment, BNSF stated there was 6-7 inches of rainfall recorded at this location in a three-day period. A flash flood order had been in effect from MP 198 going southbound prior to the time of derailment. No flash flood order was in effect at the time of the derailment.

The Roadmaster stated that this segment of track was a chronic location for the subgrade failing to hold geometry, and that track surfacing was performed every month leading up to the derailment to keep the track in compliance with FRA Class 4 standards. The Roadmaster could not give an exact date of the last time this segment of track was surfaced. Grout injections were completed in July of 2019 in this segment of track.

BNSF track inspection records for the period of August 8 - September 8, 2020, revealed the track supervisor traversed Main Track No. 1 a total of seven times, and visually inspected Main Track No. 1 while traversing Main Track No. 2 an additional four times. No defects were recorded at the location of the derailment. The track supervisor placed a 40-mph slow order on September 3, 2020, for 1 ¼ inch cross level at the location of the derailment. This slow order was still in place at the time of derailment.

A review of the BNSF 4040 outboard video camera clearly showed some evidence of moderate sliding on the west field side of the track as the train approached.

Following the derailment, a total of 74 track panels were used to reconstruct the main tracks and temporarily restore service (51 track panels in Main Track No. 1 and 23 track panels in Main Track No. 2). A subgrade stabilization project is now planned to be completed in the coming months.

Conclusion: FRA determined track condition was the probable cause of the derailment.

Overall Conclusion

FRA's investigators concluded that neither defective locomotive/car mechanical, nor operating practices were the primary or contributing factors in the cause of this derailment. Based on the track indication recorder data (BNSF 4040), failed subgrade condition was the primary cause of this accident.

Probable Cause and Contributing Factors

FRA determined the probable cause to be T001 -- Roadbed settled or soft.