Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2019-1312

Norfolk Southern Railway Company (NS) Derailment
Bartow, Georgia
January 6, 2019

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 January 6, 2019, at approximately 8:13 p.m., EST, an eastbound Norfolk Southern Railway Company (NS) freight Train 192G506 (Train 1) derailed at NS Milepost (MP) S112.7 on the NS Georgia Division, Savannah District in Bartow, Georgia.

Train 1 was traveling at a recorded speed of 48.9 mph, when the third locomotive and 39 cars derailed in a general a pileup at or near the point of derailment. Nineteen hazardous material cars were among the total cars derailed.

A precautionary evacuation was ordered for approximately 280 people in Bartow by the town's Mayor. At the time of the derailment, it was dark, clear, and 67 ºF.

There were two non-fatal injuries to railroad personnel and none to the public. The damages reported by NS were estimated to be $3,005,817 for equipment and $804,811 for track, totaling $3,810,628.

FRA determined the rail to be broken at a field weld site. T204 - Broken Rail-Field (Weld) was the probable cause of the derailment.

FRA determined this derailment was not PTC preventable.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2019-1312

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Norfolk Southern Railway Company	NS	1234711

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Norfolk Southern Railway Company	NS	1234711

2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	1/6/2019	8:13 PM

5. Type of Accident/Incident
Derailment

6. Cars Carrying HAZMAT	7. HAZMAT Cars Damaged/Derailed	8. Cars Releasing HAZMAT	9. People Evacuated	10. Subdivision
33	19	3	280	NORFOLK SOUTHERN CORPC

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Bartow, GA	S113	GA	JEFFERSON

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
67 ˚F	Dark	Clear	Main

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Single Main track	Freight Trains-60, Passenger Trains-80	13	East

23. PTC Preventable	24. Primary Cause Code	25. Contributing Cause Code(s)
No	[T204] Broken Rail - Weld (field)	

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	192G506

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
48.9 MPH	R	4360		0

6. Type of Territory

Signalization:
Not Signaled

Method of Operation/Authority for Movement:
Direct Train Control

Supplemental/Adjunct Codes:
F

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.)*	NS 3610	3	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	50	0	53	0	0
(2) Total Derailed	1	0	0	0	0	(2) Total Derailed	24	0	15	0	0

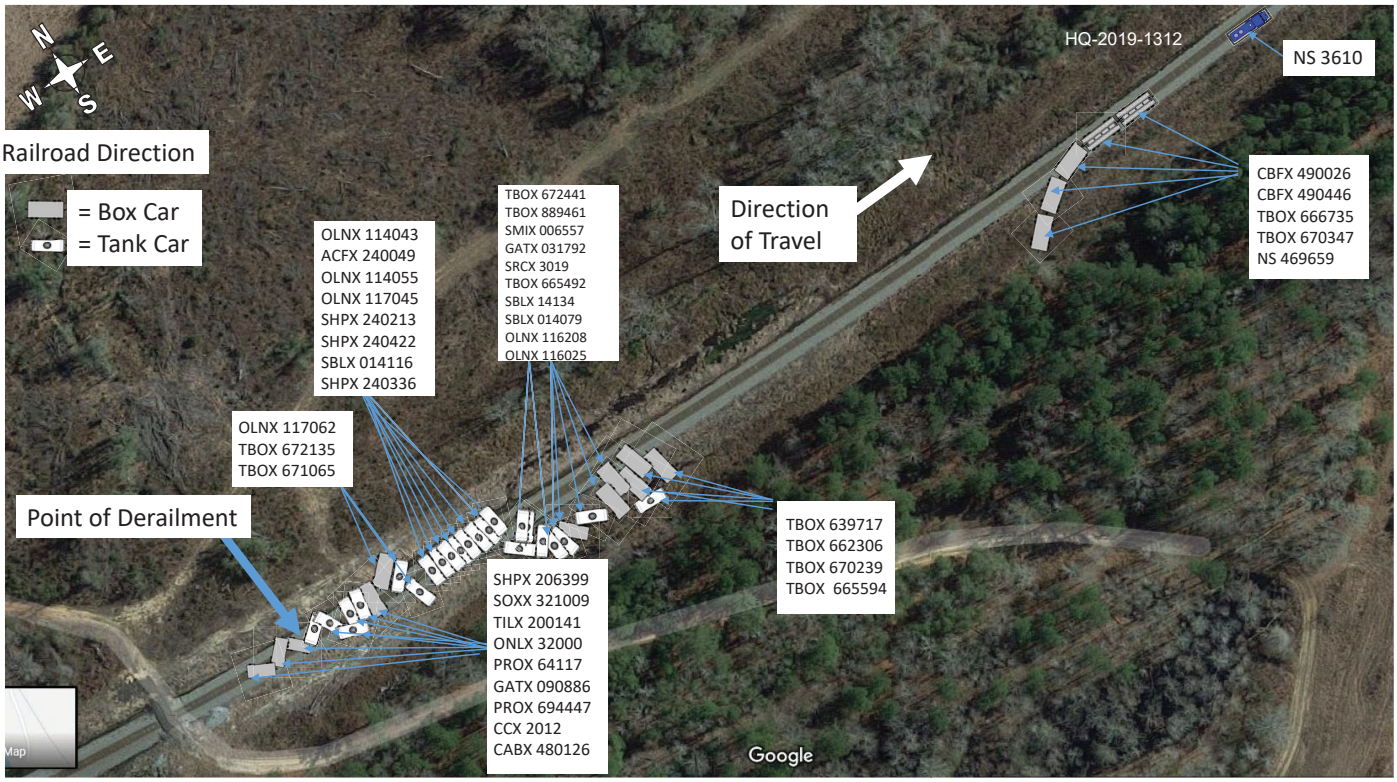
12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
3005817	804811

Number of Crew Members				Length of Time on Duty	
14. Engineers/Operators	15. Firemen	16. Conductors	17. Brakemen	18. Engineer/Operator	19. Conductor
1	0	1	0	Hrs: 4 Mins: 28	Hrs: 4 Mins: 28
Casualties to:	20. Railroad Employees	21. Train Passengers	22. Others	23. EOT Device?	24. Was EOT Device Properly Armed?
				Yes	Yes
Fatal	0	0	0	25. Caboose Occupied by Crew?	N/A
Nonfatal	2	0	0		

26. Latitude	27. Longitude
32.916270000	-82.502348000

SKETCHES

Sketch - Sketch



NARRATIVE

Circumstances Prior to the Accident

Norfolk Southern (NS) eastbound freight train 192G506 (Train 1) consisted of 3 locomotives, 50 loaded cars, 53 empty cars of various types; and was 6,918 feet long and had 4,360 trailing tons. Train 1 originated at NS Brosnan Yard in Macon, Georgia, on January 6, 2019, with a destination of Linwood, North Carolina.

The derailment occurred on the NS Georgia Division, Savannah District in Bartow, Georgia. The Savannah District operates in an east direction, and consists of a single main track, as identified in the Savannah District Timetable, with a maximum authorized speed of 49 mph. The method of operation for this subdivision is Track Warrant Control.

The crew of Train 1 was comprised of a locomotive engineer and conductor. The crew went on duty at 3:45 p.m., EST, January 6, 2019, at NS Brosnan Yard, the home terminal for both crew members. Both crew members had received the statutory off-duty period prior to reporting for duty. The Engineer was seated at the controls on the right side of the leading locomotive and the Conductor was seated on the left side of the lead locomotive.

NS mechanical personnel performed the required regulatory mechanical inspection and initial terminal train air brake test at Brosnan Yard, with no exceptions noted. There were no special restrictions that applied to the train.

Approaching the accident site, in the direction the train was traveling, the track is tangent for two miles with a 0.2-percent descending grade before entering a right hand 0.7-degree curve for 0.25 miles with a 0.36-percent descending grade. There is a private farm road crossing with passive warning devices in the curve approximately 250 feet from the Point of Derailment (POD) at MP S113. East of MP S112.7 the track continues into a right hand 0.7-degree curve for 0.4 miles with a continuing 0.36-percent descending grade.

At the time of the derailment, it was dark, clear, and 67 ºF.

The Accident

On January 6, 2019, at approximately 8:13 p.m., Train 1 was traveling east at a recorded speed of 48.9 mph. The two leading locomotives cleared the POD before the third locomotive (NS 3610) and the next 39 cars derailed and landed in remote areas in a general pile up. Nineteen of the 39 cars that derailed were loaded hazardous materials tank cars. (13 Chlorine cars, 3 Sodium Hydroxide Soulution cars, 1 Hydrogen Peroxide car, 1 Hydrochloric Acid car and 1 Bisulphite; aqueous solutions car).

Three hazmat cars leaked because of the derailment, and a fourth hazmat tank car leaked while clean-up crews were in the process of moving damaged hazardous material tank cars to staging areas.

The Hydrogen Peroxide and Hydorchloric Acid cars leaked through the sill pad that is welded to the tank near the trucks/wheels. The Bisulphites, aqueous solutions tank car leaked a small amount through the bottom outlet valve. One Chlorine tank car began to relieve pressure after the accident was over and crews began to clear the area. The Chlorine tank car leaked about a pound of product before the local environment service crew could suppress the leak by applying a c-kit to hold the pressure.

A precautionary evacuation was ordered for approximately 280 people in Bartow by the town's Mayor. The evacuation was lifted on January 7, 2019, at 6:50 a.m., EST, after it was declared safe for work crews to enter the derailment site.

There were two non-fatal injuries to railroad personnel and none to the public. Local authorities were dispatched to the scene. First responders and a regional hazmat team were given the authority to investigate the accident by the local Emergency Management Agency. Railroad wrecking contractors Hulcher Services, RJ Corman, and Crane Masters were called to the scene to clear the derailed equipment. Hepaco Environmental Services, Specialized Professional Services, Inc. (SPSI), and SRS Emergency Response were also at the scene. The damages reported by NS were estimated to be $3,005,817 for equipment and $804,811 for track, totaling $3,810,628.

The track was cleared and opened for traffic on January 9, 2019, at 10:00 a.m.

Post-accident/Incident Investigation

A Federal Railroad Administration (FRA) Track Inspector, Motive Power and Equipment Inspector, and Hazardous Materials Inspector responded to the accident site immediately. The FRA team inspected the accident site as part of their investigation.

FRA's investigators requested and received all records, forms, and other documentation necessary to conduct their investigation into the probable cause of the derailment. The following analysis and conclusions represent the findings of FRA's investigation.

Analysis and Conclusions

Analysis-Track: FRA obtained track inspection records from Norfolk Southern from October 2018 to the date of derailment. NS inspected this segment of track at the frequency requirements of the Title 49 Code of Federal Regulations (CFR) Part 213-Track Safety Standards.

On August 27, 2018, an NS rail bound geometry train tested the Savannah District and did not identify any exceptions in the derailment area.

On December 31, 2018, and January 3, 2019, a qualified NS track inspector conducted a regular track inspection and took no exception to the track conditions in the area.

NS conducted internal rail testing at intervals above the required frequency in the Track Safety Standards with the most recent test occurring on October 2, 2018. The field welds were made on October 15, 2018.

Due to the catastrophic nature of the derailment, track measurement notes were unable to be recorded beyond the point of derailment. Re-railing and repair operations had begun prior to FRA's arrival on the scene thus compromising the integrity of the track measurement notes for stations prior to the derailment.

The 132-pound broken rail was initially examined at the derailment site before being sent to the NS Research and Test Facility in Roanoke, Virginia. The rail was a 21-foot long plug rail with thermite field welds at both ends of the plug. The rail section was discovered submerged in mud and water in the vicinity of the point of derailment approximately 36 hours after the time of derailment. This allowed the oxidation process to begin on the rail ends. The field weld on the east end showed indications of finning along the bottom of the rail base. Finning occurs during the welding process when molten metal leaks from the casting mold and does not fully fuse with the rail ends. The east end of the rail showed significant receiving batter on the head of the rail. The field weld on the west end of the plug also showed indications of finning along the bottom of the rail base. This rail was determined to be the point of derailment for this incident.

FRA reviewed the outward facing video recorders of the last westbound train traveling in the area and the train involved in the derailment. During the review of the outward facing video recorder from the lead locomotive of Train 373G, no signs were indicated of a broken rail. On January 6, 2019, at approximately 5:00 p.m. train 373G's outward facing video recorder did not present a shiny spot near the POD which would indicate a broken rail. During a review of the outward facing video recorder from the lead locomotive of derailing Train 1, FRA observed clear shiny spots indicating two broken rails.

FRA believes the rail most likely broke under the movement of the westbound train, which previously traversed the area.

Conclusion: FRA determined a broken rail to be the probable cause of the derailment. (cause code T204)

Analysis – Locomotive Engineer Operating Performance: The locomotive was equipped with a speed indicator and an event recorder. The relevant event recorder data was downloaded by NS officials at the accident site.

The locomotive engineer followed all applicable railroad operating and train handling requirements.

Conclusion: FRA determined the Locomotive Engineer Operating Performance did not contribute to the cause or severity of the derailment.

Analysis – Toxicological Testing: The accident met the criteria for Title 49 CFR Part 219 Subpart C, Post-Accident Toxicological Testing. Both train crew members were tested under this authority with negative results.

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

Overall Conclusions

FRA determined that NS was in full compliance with its own standards and all applicable Federal standards. FRA believes the rail most likely broke under the movement of the previous westbound train traversing the derailment site on January 6, 2019, at approximately 5:00 p.m.

Probable Cause

FRA determined the rail to be broken at a field weld site. T204 - Broken Rail-Field (Weld) was the probable cause of the derailment.

FRA determined this derailment was not PTC preventable.