Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2017-1231

CSX Transportation (CSX)
Atlanta, GA
October 5, 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 5, 2017, at approximately 02:48 a.m., EST, northbound CSX Transportation (CSX) Freight Train Q54203 derailed 14 cars on a single main track at milepost ANB862.2 in Atlanta, Georgia. The train consisted of three lead locomotives and 197 freight cars, which had a total of 68 loads and 129 empties. At the time of the derailment, the train was operating from double main track to single main track through the turnout at Control Point (CP) South Bellwood at milepost ANB862.2. This location is on the CSX Atlanta Division, Atlanta Terminal Subdivision. The method of train operation is by signal indication of a Traffic Control System. The train originated in Waycross, Georgia and was traveling to Cincinnati, Ohio.

Prior to the derailment, Train Q54203 experienced an undesired emergency brake application at milepost ANB831.5 near Aberdeen, Georgia, about 30 miles south of the derailment site. The train continued north and experienced another undesired emergency brake application at milepost ANB862.2, which was the Point of Derailment (POD). The POD was located within the turnout at CP South Bellwood. The train was in full dynamic braking and traveling at 15 mph when the derailment occurred.

One of the 14 cars that derailed crashed into a house on the west side of the track. The homeowner was transported to the hospital with non-life-threatening injuries.

As a result of the derailment, 600 feet of track and one turnout was damaged. Damages were estimated at $179,511.00 for mechanical, $63,110.00 for track, and $2,564.00 for signal; equaling $245,185 in total monetary damage. The accident caused substantial damage to the resident’s home and property.

This derailment was not Positive Train Control (PTC) preventable. The temperature was 61° F with clear skies and wind speeds of 4 mph. Both train crew members were post-accident toxicological tested.

The Federal Railroad Administration considers the probable accident cause was H503 - Buffing or slack action excessive, train handling, with a contributing cause of H504 - Buffing or slack action excessive, train makeup.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2017-1231

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
CSX Transportation	CSX	000172018

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
CSX Transportation	CSX	000172018

2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	10/5/2017	2:48 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
33	0	0	0	Atlanta Terminal Subdivision

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Atlanta	ANB862.2	GA	FULTON

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

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
# 1 Main	Freight Trains-25, Passenger Trains-30	50.6	North

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	Q54203

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
15.0 MPH	R	12911		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.)*	SOXX5950	60	no		0	0
(2) Causing *(if mechanical, cause reported)*	NA	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	3	0	0	0	0	(1) Total in Equipment Consist	68	0	129	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	7	0	7	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
179511	65674

14. Primary Cause Code
H503 - Buffing or slack action excessive, train handling

15. Contributing Cause Code
H504 - Buffing or slack action excessive, train make-up

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: 48	Hrs: 9 Mins: 48

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others
Fatal	0	0	0
Nonfatal	0	0	1

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

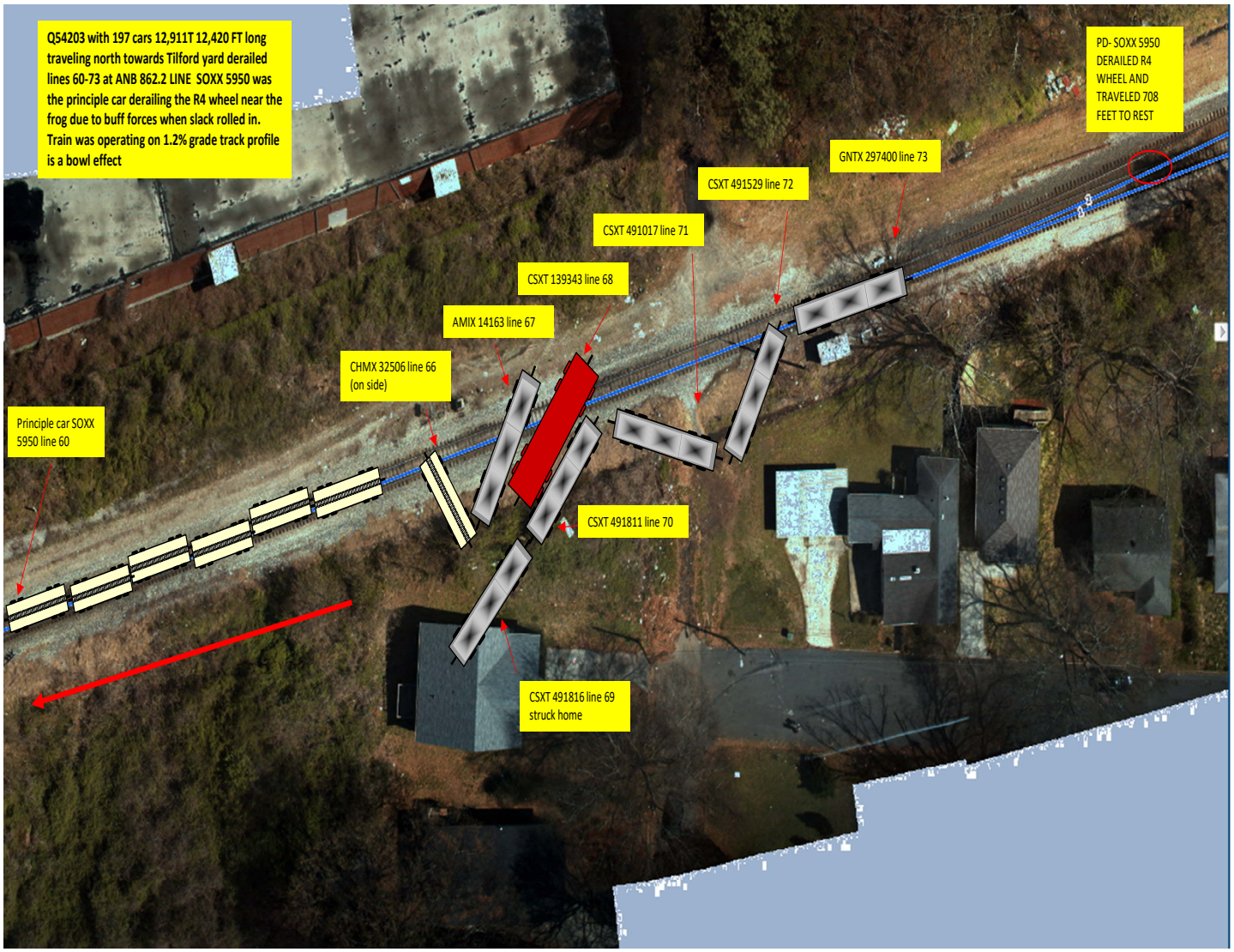
27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
33.764178000	-84.431070000

SKETCHES

Sketch

HQ-2017-1231



NARRATIVE

Circumstances Prior to Accident

Northbound CSX Transportation (CSX) Freight Train Q54203 (Q542) consisted of three lead locomotives (CSXT 853, CSXT 7694, CSXT 961) and 197 freight cars made up of 68 loads and 129 empties. The train was 12,420 feet in length with 12,911 trailing tons. The train originated at CSX Rice Yard in Waycross, Georgia, and was destined for Cincinnati, Ohio. The CSX timetable direction is north, and will be utilized throughout this report.

The Q542 crew was comprised of an engineer and a conductor on duty October 4, 2017, at 5:00 p.m., EDT, at the CSX Manchester Yard office in Manchester, Georgia (milepost ANB788.0). Manchester is the home terminal for both crew members. Both had received the statutory time off before reporting for duty. The Engineer was off-duty 64 hours and 35 minutes prior to reporting for duty and the Conductor was off 16 hours and 54 minutes. Upon reporting for duty, the crew conducted a job briefing and reviewed all their paperwork. They were then instructed by the Manchester Trainmaster to pick-up 43 cars at Union City Yard after departing Manchester.

Inbound Q542 arrived in Manchester at 7:04 p.m. where the outbound relieving crew was briefed by the inbound crew prior to departure. After contacting the dispatcher, the outbound crew was instructed to await the arrival of Train A73304 before departing Manchester. Q542 departed Manchester Yard on signal indication at approximately 7:58 p.m., operating on Main Track 1 north toward Union City, Georgia. The Engineer was seated at the controls of the lead locomotive (CSXT 853) and the Conductor seated to his left on the "fireman's" side.

At approximately 9:45 p.m., while en route to Union City, Train Q542 experienced an undesired emergency brake application at milepost ANB831.5 near Aberdeen, Georgia. The train air brake pressure was immediately restored. The Conductor walked the train, finding and replacing a leaking air hose gasket. After replacing the gasket, Train Q542 departed Aberdeen at approximately 10:50 p.m. and arrived at Union City about 11:21 p.m. with no other issues. As planned, they picked-up 43 cars from Tracks #2 and #3, placing them at the front of the train. The Conductor updated the train consist and they departed at approximately on October 5, 2017 at 01:05 a.m. The remainder of the trip was uneventful until the accident.

The temperature was 61° F with clear skies and wind speeds of 4 mph.

The Accident

On October 5, 2017, at 02:48 a.m., EST, Train Q542 derailed. At the time of the derailment, the train was operating around a curve from double main track to single main track through the turnout at Control Point (CP) South Bellwood (milepost ANB862.1) at 15 mph when the crew felt a bump that was likely caused by the slack running in on the trailing cars. About 10 seconds after the bump, the train experienced an undesired emergency air brake application. The crew contacted the Dispatcher, notifying them of the

emergency air brake application and requested assistance from the Trainmaster. The Trainmaster and Conductor went to the first road crossing and found no issues with the train. When they arrived at the second road crossing, Andrews Street N.W., they were met by the Atlanta Police Department and were informed of the derailment. The Conductor and Trainmaster inspected the derailed equipment and found 14 cars derailed.

The point of derailment (POD) was located in the turnout at South Bellwood. Cars positioned 60 through 73 derailed as follows:

Position 60 - SOXX 5950 – Empty Cover Hopper – First derailed car upright in line with the rail;
Position 61 - CEFX 13804 – Loaded Cover Hopper – Derailed upright in line with the rail;
Position 62 - CEFX 13601 – Loaded Cover Hopper – Derailed upright in line with the rail;
Position 63 - SRCX 4348 – Loaded Cover Hopper – Derailed upright in line with the rail;
Position 64 - SRCX 3007 – Loaded Cover Hopper – Derailed upright in line with the rail;
Position 65 - CMHX 32516 – Loaded Cover Hopper – Derailed upright in line with the rail;
Position 66 - CMHX 32506 – Loaded Cover Hopper – Derailed on its side;
Position 67 - AIMX 14163 – Loaded Gondola – Derailed upright in accordion-style position;
Position 68 - CSXT 139343 – Empty Box – Derailed upright in accordion-style position;
Position 69 - CSXT 491816 – Empty Gondola – Derailed upright impacting a home adjacent to the right-of-way;
Position 70 - CSXT 491811 – Empty Gondola – Derailed upright in accordion-style position;
Position 71 - CSXT 491017 – Empty Gondola – Derailed upright in accordion-style position;
Position 72 - CSXT 491529 – Empty Gondola – Derailed upright in accordion-style position;
Position 73 - GNTX 297400 – Empty Gondola – Derailed upright in line with the rail.

Of the 14 cars derailed, cars in the 60-63 positions were loaded and the cars in the 64-73 positions were empty. The car in the 69th position struck and came to rest inside a nearby house. As a result, the homeowner was transported to the hospital with non-life-threatening injuries. There were no injuries to crew members, no hazardous materials release, and no evacuations associated with this incident.

As a result of the derailment, 600 feet of track and one turnout was damaged. Damages were estimated at $179,511.00 for mechanical, $63,110.00 for track, and $2,564.00 for signal; equaling $245,185 in total monetary damage. The accident caused substantial damage to the resident's home and property. The train crew was post-accident toxicological tested.

Analysis and Conclusions

Analysis - Toxicological Testing - The accident did not meet the criteria for Title 49 Code of Federal Regulations Part 219 Subpart C, Post-Accident Toxicological Testing. Both crew members were tested under 49 CFR Part 219 Subpart E - Reasonable Cause Testing, 219.403(a). Due to time requirements for testing, CSX could not rule out train handling as a probable cause, therefore train crew members were tested under railroad reasonable cause authority. Tests were negative for both crew members.

Conclusion- Toxicological Results Report - Impairment of the crew was not a causal factor in this accident.

Analysis - Mechanical - CSX records indicate Q542 originated at CSX Rice Yard in Waycross, Georgia, where the train consisted of 154 freight cars. It received the required Class I and Class III air brake tests on October 3, 2017. The 43 cars added to the train at Union City received the required Class I brake test prior to departure.
The investigation revealed 14 freight cars were derailed, with some in an accordion arrangement with the trucks and wheels scattered. Of these cars, CMHX 32506 (covered hopper) was on its side, and the A end of CSXT 491816 (gondola) was stuck into the side of a nearby house. These subject cars were near the middle of the derailment. An inspection of the 14 derailed cars disclosed derailment damage to the trucks, brake components, and safety appliances. All other cars were inspected and brake tested by CSX mechanical personnel with no defective conditions noted.

Conclusion - Mechanical - The Federal Railroad Administration's (FRA) investigation and inspections did not disclose any mechanical conditions that caused or contributed to the derailment.

Analysis - Track Structure - The track at milepost (MP) ANB862.2 is double main track transitioning into single main track with a 2-degree right hand curve over a power-operated switch located at Control Point (CP) South Bellwood. Approaching the derailment location in a northward direction of travel, there is a descending grade of 1.2 percent continuing for about 6,000 feet. The track consists of 136-pound rail installed on the east side and 141-pound rail installed on the west side. It is Continuous Welded Rail (CWR) fastened to wood crossties with cut spikes and anchors applied in a box-anchored pattern on every other crosstie. The 136-pound CWR rail through the area of derailment has a manufacture date of 2013 and the 141-pound CWR rail has a manufacture date of 2005. The installation date of the rail is not known. There are no CSX records of CWR disturbance, crosstie replacement, rail replacement or track surfacing for the period from July 5, 2017 to October 5, 2017.

Track measurements were taken at 15.6-foot intervals on the undisturbed track from the suspected point of derailment north 32 feet and south 201.6 feet. This section of track had an average curvature of 1.2 degrees with 3/4 inches of super elevation.
The main track at the accident location has a maximum speed of 20 mph, FRA Class 2, with an estimated 50.6 million annual gross tons. Weekly track inspections with at least three calendar days between inspections are required for this segment of track. The previous track inspection was conducted on September 30, 2017, by a CSX Roadmaster. No exceptions were noted at the accident location. Track inspection reports reviewed for the months of July, August, September, and October 2017, through the time of the accident, show proper frequency of inspections, with no defective conditions recorded in the area of the derailment.

Conclusion – Track Structure - There were no track defects noted. Track was not a causal or contributing

factor for this accident.

Analysis - Signal System - The method of train operation through the involved area is by signal indication of a Traffic Control System (TCS). The wayside signals are color light type and installed to the right of main tracks. This line segment is designated for the installation of Positive Train Control (PTC) at a future date. The circumstances surrounding this accident indicate it was not PTC preventable.

On October 5, 2017, the associated TCS equipment was inspected and tested by CSX signal personnel under observation of FRA. Various operational tests were conducted primarily at CP South Bellwood and southward. Operational tests of the signal system revealed that the signals functioned as intended in accordance with FRA safety regulations.

On October 11, 2017, a review, inspection, and analysis of FRA required periodic signal system test records was conducted. Additionally, a review and analysis involving the event recorder downloads retrieved from the track wayside Defect Equipment Detector (DED) located at MP ANB845.80 was conducted. The information showed no defective conditions were detected by the DED as Q542 passed northward through the scanners.

Conclusion – Signal System - The FRA investigation of the incident revealed that the signal system was not a contributing factor in this train derailment. The derailment was not PTC preventable.

Analysis- Fatigue Analysis: Engineer - 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. 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 the subject of this investigation. The analysis indicated that the subject was at an effectiveness level of 72.41 percent, indicating fatigue was possible for this employee.

Conclusion- Fatigue Analysis: Engineer - FRA concluded the Engineer had an irregular work-rest cycle and was working in the early morning hours when he was predisposed to sleep. Fatigue was probable for the Engineer.

Analysis- Fatigue Analysis: Conductor - 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. 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 the subject of this investigation. The analysis indicated that the subject was at an effectiveness level of 59.46 percent, indicating fatigue was probable for this employee.

Conclusion- Fatigue Analysis: Conductor **-** FRA concluded the Conductor had an irregular work-rest cycle

and was working in the early morning hours when he was predisposed to sleep. Fatigue was probable for the Conductor.

Analysis-Locomotive Event Recorders - CSX Transportation Managers and FRA reviewed the locomotive event recorder downloads. Event recorder data revealed that the train had been stopped from 2:11 a.m. until 2:37 a.m. While starting the train at 2:37 a.m., the Engineer released the air brakes and applied throttle moving up to the fourth notch and applying 120,000 pounds of force before the train began movement at 2:39 a.m. At 2:47 a.m., while the train was traveling 17 mph, the Engineer entered dynamic braking. After 19 seconds, the train experienced a run in of slack as indicated by the speed increasing as the Engineer continued to increase the dynamic breaking effort to full effort. The train continued 1,870 feet before SOXX 5950 derailed, and another 708 feet before the train stopped.
FRA also found that of the 12,911 trailing tons, there was 10,429 trailing tons behind SOXX 5950.

Conclusion - The Engineer used excessive dynamic braking while operating on a descending grade, in a curve, and through a turnout creating excessive buff forces that allowed the R4 wheel on SOXX 5950 to lift.

Overall Conclusion

FRA investigation did not identify any track or mechanical conditions that would contribute to the cause or severity of this accident. After review of the train build, FRA determined that while CSX was compliant with their rules on the placement of loads and empties in the train, 57 of the 68 loaded cars, and 10,429 trailing tons were behind the first car to derail. The train was operating around a curve from double main to single main through a turnout on a 1.2-percent descending grade. The Engineer's use of dynamic braking did not allow time for the train to adjust to the buff forces from the excessive trailing tonnage behind the first car to derail.

Probable Cause and Contributing Factors

FRA determined the probable cause for this accident to be H503 – "Buffing or slack action excessive, train handling," with a contributing cause of H504 – "Buffing or slack action excessive, train makeup."