



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

***Accident Investigation Report
HQ-2015-1082***

***Norfolk Southern Railway Company (NS)
Riddleville, GA
August 7, 2015***

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.

TRAIN SUMMARY

1. Name of Railroad Operating Train #1 Norfolk Southern Railway Company	1a. Alphabetic Code NS	1b. Railroad Accident/Incident No. 116852
2. Name of Railroad Operating Train #2 Norfolk Southern Railway Company	2a. Alphabetic Code NS	2b. Railroad Accident/Incident No. 116852

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance Norfolk Southern Railway Company	1a. Alphabetic Code NS	1b. Railroad Accident/Incident No. 116852
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 8/7/2015	4. Time of Accident/Incident 1:11 PM
5. Type of Accident/Incident Head On Collision		
6. Cars Carrying HAZMAT 1	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0
		9. People Evacuated 0
10. Subdivision Georgia		
11. Nearest City/Town Riddleville	12. Milepost (to nearest tenth) S129.7	13. State Abbr. GA
		14. County WASHINGTON
15. Temperature (F) 90 °F	16. Visibility Day	17. Weather Clear
18. Type of Track Main		
19. Track Name/Number Main	20. FRA Track Class Freight Trains-60, Passenger Trains-80	21. Annual Track Density (gross tons in millions) 19
		22. Time Table Direction East

OPERATING TRAIN #1

1. Type of Equipment Consist: Freight Train				2. Was Equipment Attended? Yes		3. Train Number/Symbol 208G506									
4. Speed (recorded speed, if available) R - Recorded E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 2427		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>Not Signaled</u> Method of Operation/Authority for Movement: <u>Direct Train Control</u> Supplemental/Adjunct Codes: <u>P</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>		NS 9796	1	yes			0	0							
(2) Causing <i>(if mechanical, cause reported)</i>		NS 9796	1	yes	9. Was this consist transporting passengers?		No								
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)		a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)		Loaded		Empty				
			b. Manual	c. Remote	d. Manual	e. Remote			a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose		
(1) Total in Train		2	0	0	0	0	(1) Total in Equipment Consist		10	0	0	0	0		
(2) Total Derailed		2	0	0	0	0	(2) Total Derailed		2	0	0	0	0		
12. Equipment Damage This Consist 4216511			13. Track, Signal, Way & Structure Damage 0												
14. Primary Cause Code H404 - Train order, track warrant, track bulletin, or timetable authority, failure to comply															
15. Contributing Cause Code H404 - Train order, track warrant, track bulletin, or timetable authority, failure to comply															
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: 6 Mins: 40				Hrs: 6 Mins: 40			
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?				26. Was EOT Device Properly Armed?			
Fatal		0		0		0		Yes				Yes			
Nonfatal		2		0		0		27. Caboose Occupied by Crew?				N/A			
28. Latitude 32.951339721					29. Longitude -82.726305127										

OPERATING TRAIN #2

1. Type of Equipment Consist: Freight Train				2. Was Equipment Attended? Yes		3. Train Number/Symbol G23G507					
4. Speed (recorded speed, if available) R - Recorded E - Estimated		Code E	5. Trailing Tons (gross excluding power units) 3230		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>Not Signaled</u> Method of Operation/Authority for Movement: <u>Other Than Main Track</u> Supplemental/Adjunct Codes: <u>P</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>		NS 1637	1	yes				0	0		
(2) Causing <i>(if mechanical, cause reported)</i>		NS 1637	1	yes	9. Was this consist transporting passengers?			No			
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty		
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose
(1) Total in Train	1	0	0	0	0	(1) Total in Equipment Consist	26	0	1	0	0
(2) Total Derailed	1	0	0	0	0	(2) Total Derailed	5	0	0	0	0
12. Equipment Damage This Consist 217632			13. Track, Signal, Way & Structure Damage 99580								
14. Primary Cause Code H404 - Train order, track warrant, track bulletin, or timetable authority, failure to comply											
15. Contributing Cause Code H404 - Train order, track warrant, track bulletin, or timetable authority, failure to comply											
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: 6	Mins: 14	Hrs: 6	Mins: 14		
Casualties to:	22. Railroad Employees		23. Train Passengers		24. Others	25. EOT Device?		26. Was EOT Device Properly Armed?			
Fatal	0		0		0	No		N/A			
Nonfatal	2		0		0	27. Caboose Occupied by Crew? N/A					
28. Latitude 32.951375823			29. Longitude -82.727292180								

CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved	
1. Type		5. Equipment	
2. Vehicle Speed (<i>est. mph at impact</i>)	3. Direction (<i>geographical</i>)	6. Position of Car Unit in Train	
4. Position of Involved Highway User		7. Circumstance	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?		8b. Was there a hazardous materials release by	
8c. State here the name and quantity of the hazardous material released, if any.			
9. Type of Crossing Warning 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (<i>spec. in narr.</i>) 3. Standard FLS 6. Audible 9. Watchman 12. None		10. Signaled Crossing Warning	11. Roadway Conditions
12. Location of Warning		13. Crossing Warning Interconnected with Highway Signals	14. Crossing Illuminated by Street Lights or Special Lights
15. Highway User's Age	16. Highway User's Gender	17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train	18. Highway User
19. Driver Passed Standing Highway Vehicle		20. View of Track Obscured by (<i>primary obstruction</i>)	
Casualties to:	Killed	Injured	21. Driver was
23. Highway-Rail Crossing Users		24. Highway Vehicle Property Damage (<i>est. dollar damage</i>)	22. Was Driver in the Vehicle?
26. Locomotive Auxiliary Lights?		25. Total Number of Vehicle Occupants (<i>including driver</i>)	
28. Locomotive Headlight Illuminated?		27. Locomotive Auxiliary Lights Operational?	
		29. Locomotive Audible Warning Sounded?	

10. Signaled Crossing Warning

- 1 - Provided minimum 20-second warning
- 2 - Alleged warning time greater than 60 seconds
- 3 - Alleged warning time less than 20 seconds
- 4 - Alleged no warning
- 5 - Confirmed warning time greater than 60 seconds
- 6 - Confirmed warning time less than 20 seconds
- 7 - Confirmed no warning
- N/A - N/A

Explanation Code

- A - Insulated rail vehicle
- B - Storm/lightning damage
- C - Vandalism
- D - No power/batteries dead
- E - Devices down for repair
- F - Devices out of service
- G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present
- H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)
- J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits
- K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit
- L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction
- M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed
- N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach
- O - Warning time less than 20 seconds attributed to violation of special train operating instructions
- P - No warning attributed to signal systems failure to detect the train
- R - Other cause(s). Explain in Narrative Description

SYNOPSIS

On August 7, 2015, at about 1:11 p.m., eastbound Norfolk Southern Railway (NS) Train 208G5-06 collided head-on with westbound NS Train G23G5-07. The accident occurred about 4.75 miles northwest of Riddleville, Georgia, and about 4.82 miles east of Tennille, Georgia, on single main track near Milepost (MP) S129.7 on NS's Georgia Division Savannah District between Tennille, MP S135.0 and Davisboro, Georgia, MP S122.0. The trains were operating on non-signalized (dark) territory and under track warrant authority.

Weather conditions were 94 degrees F with clear skies during daylight hours.

Train 208G5-06 was operating from Macon, Georgia, east to Savannah, Georgia. The train included a locomotive engineer and conductor. It consisted of 2 locomotives; NS 9796, leading short-hood forward, and NS 8132 trailing, with 10 loaded intermodal stack cars, one of which contained a hazardous materials shipment. The train was 2,094 feet in length with 2,427 trailing tons.

Train G23G5-07 was operating from Midville, Georgia, west to Tennille. The train included a locomotive engineer and conductor. It consisted of 1 locomotive, NS 1637, operating long-hood forward, 26 loaded freight cars, and 1 empty freight car. The train was 2,015 feet in length with 3,230 trailing tons.

The investigation revealed each train crew initiated an emergency brake application prior to impact. Train 208G5-06 was traveling at about 34 mph and Train G23G5-07 was operating at about 27 mph upon impact. Train 208G5-06 derailed two locomotives and two cars. Train G23G5-07 derailed one locomotive and five cars.

All four crew members were treated and transported to the hospital with injuries. The Engineer and Conductor of Train G23G5-07 were treated for minor injuries and released. The Engineer and Conductor of Train 208G5-06 were hospitalized with multiple injuries.

Equipment damages to Train 208G5-06 were \$4,216,511. Equipment damages to Train G23G5-07 were \$217,632. Track damages were \$99,580. Total damages for track and equipment were \$4,533,723.

The accident was PTC-preventable. This was not an Amtrak route. One hazardous materials shipment was involved; it did not derail and did not release. There was no evacuation.

Probable cause of this accident was Train 208G5-06's crew's failure to comply with Track Authority.

NARRATIVE

CIRCUMSTANCES PRIOR TO ACCIDENT

On August 7, 2015, at about 1:11 p.m., eastbound Norfolk Southern Railway (NS) Intermodal Train 208G5-06 collided head-on with westbound NS local Freight Train G23G5-07. The accident occurred on single main track near Milepost (MP) S129.7 on NS's Georgia Division Savannah District. The location is between Tennille MP S135.0 and Davisboro, Georgia, MP S122.0 near Riddleville, Georgia. The trains were operating on non-signaled (dark) territory and under track warrant authority. At the time of the accident, it was daylight, clear, with a temperature of about 94 degrees F.

The crew of Train 208G5-06 consisted of a locomotive engineer and a conductor. They went on duty at Macon, Georgia, at 6:20 a.m. EST, on August 7, 2015, after having received more than the required statutory off-duty rest. They waited about 1.5 hours for Train 208G5-06 to arrive from its initial terminal in Austell, Georgia. They re-crewed the inbound crew when Train 208G5-06 arrived at Macon and received permission to proceed from the dispatcher. Train 208G5-06 consisted of 2 locomotives; NS 9796 leading short-hood forward, and NS 8132 trailing, with 10 loaded intermodal stack cars, including several multiunit cars, one of which contained a hazardous materials shipment. The train was 2,094 feet in length with 2,427 trailing tons. The train proceeded west from Macon to Toombsboro, Georgia, MP S154.5, to meet an opposing train. At Toombsboro, they received Track Warrant Authority Number 5255 to proceed east to Tennille East after the arrival of the opposing train.

The crew of Train G23G5-07 consisted of a locomotive engineer and a conductor. They went on duty at Tennille, at 07:01 a.m., on August 7, 2015, after having received more than the required statutory off-duty rest. Train G23G5-07 consisted of 1 locomotive, NS 1637 operating long-hood forward, 26 loaded freight cars, and 1 empty freight car. The train was 2,015 feet in length with 3,230 trailing tons. After reporting on duty, the crew began reviewing their paperwork and held a job briefing. After completing their job briefing, they took a taxi to the Midville, Georgia, siding where they had tied-up their train the previous night. After arriving at Midville siding, they boarded their train and waited for track authority from the dispatcher. They received Track Warrant Authority Number 5324 to work between Midville MP S95 and MP S100 and then to proceed west from MP S100 to MP S125. They pulled out of the Midville siding, then shoved their train back over the main crossing and completed a Class 1 brake test. They departed Midville and headed west.

Eastbound Train 208G506 was operating on tangent track with approximately 0.38 ascending grade, westbound Train G23G507 had recently exited a 2.8-degree left-hand curve with a descending grade of approximately 0.38.

THE ACCIDENT

At 12:34 p.m., Train G23G5-07 received Track Warrant Authority Number 5523, voiding previous Track Authority Number 5324, to proceed west from MP S100 to Tennille East. The dispatcher also gave them permission to enter Tennille Yard Limits after talking to Train G24G5-07, the yard job working at Tennille East.

At 1:02 p.m., in Tennille, Train 208G5-06 received Track Warrant Authority Number 5619 to proceed east from Tennille East to Wadley with the instructions, "Do not depart until after the arrival of NS 1637 West (G23G5-07) at Tennille East."

Train G23G5-07 passed MP 129 operating west at about 40 mph when the crew saw the headlights of an approaching train, 208G5-06. The Engineer was seated in the engineer's seat operating long-hood forward. The Conductor was seated in the conductor's seat. The Conductor yelled at the Engineer and the Engineer initiated an emergency brake application. The Engineer and Conductor exited the cab through the conductor's door, climbed down the steps, jumped from their train, and ran into the woods to avoid being struck by the pending collision.

Similarly, Train 208G5-06 passed MP 130 operating east at about 46 mph. The Engineer was likely in the engineer's seat but he did not remember when later interviewed. The Conductor was seated in the conductor's seat. Shortly thereafter, the train was placed into emergency brake application, presumably by the Engineer. The Conductor exited the front door of the lead locomotive (NS 9796) and jumped from the train. The Engineer did not remember jumping from the locomotive when later interviewed.

At about 1:11 p.m., Train 208G5-06 collided head-on with Train G23G5-07 on single main track about 200 yards east of Sun Hill Grange road near MP 129.7. Train 208G5-06 was traveling at 34 mph and NS Train G23G5-07 was traveling at 27 mph upon impact.

The lead locomotive of Train 208G5-06, NS 9796, derailed and projected upward about 50 feet after climbing up and over the lead locomotive of train G23G5-07 (NS 1637). NS 9796 came to rest on its left side supported by the frame of NS locomotive 1637 and first three freight cars of Train G23G5-07. NS 9796 received extensive damage; its engine had been ejected from the carbody, its trucks had been ejected from under the frame, and its front cab door was found about 150 feet into the woods. The trailing locomotive of Train 208G5-06, NS 8132, derailed and came to rest on its right side about 30 feet from the roadbed with its trucks separated from the carbody. The first and second freight cars of Train 208G5-06, three unit deep-well articulated COFC stack car AOK 55345 and single unit COFC stack car FEC 70076, derailed but remained upright.

The locomotive of Train G23G5-07, NS 1637, derailed and was completely destroyed. Traveling long-hood forward, its engine was ejected and its entire carbody was separated from the frame at the air compressor compartment to the cab compartment. Its short-hood and cab compartment also received extensive damage from the trailing freight cars upon impact. The first three freight cars of Train G23G5-07, flat-bulkhead center beam Cars RVPR 6106, RVPR 6113, and RVPR 6101 derailed and piled up on their sides underneath the lead locomotive of NS Train 208G5-06 (NS 9796). The fourth and fifth freight cars of NS Train G23G5-07, flat-bulkhead center beam Car TTZX 856243, and Gondola Car DJJX 950935, derailed but remained upright.

Following the collision, the crew of Train G23G5-07 assessed their injuries, viewed the area for any immediate safety concerns, and began searching for the crew members of the other train (Train 208G5-06). They found the other crew members and provided assistance until emergency responders arrived.

After emergency responders arrived, all four crew members were treated and transported to the hospital with injuries. The Engineer and Conductor of NS Train G23G5-07 were treated for minor injuries and released. The Engineer and Conductor of Train 208G5-06 were hospitalized with multiple injuries.

Equipment damages to Train 208G5-06 were \$4,216,511. Equipment damages to Train G23G5-07 were \$217,632. Track damages were \$99,580. Total damages for track and equipment were \$4,533,723.

The accident was PTC-preventable. This was not an Amtrak route. One hazardous materials shipment was involved; it did not derail and did not release. There was no evacuation.

POST-ACCIDENT INVESTIGATION

FEDERAL POST-ACCIDENT TOXICOLOGY TESTING – ANALYSIS:

All train crew members of both Train G23G5-07 and Train 208G5-06 were tested for alcohol and drug usage in accordance with the Federal Railroad Administration's (FRA) post-accident testing requirements. FRA's Post-Accident Forensic Toxicology Result Reports indicate the four employees tested had negative test results.

FEDERAL POST ACCIDENT TOXICOLOGY TESTING – CONCLUSION: All tests were negative. Crew impairment was not a causal or contributing factor.

OPERATING CREW – ANALYSIS:

On August 27, 2015, FRA interviewed the Engineer and Conductor of Train G23G5-07, engineer at the home of NS' UTU Local Chairman. Both explained they were operating west under Track Authority Number 5523, when they saw the headlights of an approaching train (208G5-06) coming toward them. The complete reports of interview and witness statement are included with this report.

On September 18, 2015, FRA interviewed Train 208G5-06's Engineer at his home. He was represented by the Brotherhood of Locomotive Engineers and Trainmen's Vice Chairman. The Engineer explained he did not remember the collision or the events leading up to it. He further explained he was experiencing memory loss due to a head injury received during the derailment. The complete report of interview is included with this report.

On October 14, 2015, FRA interviewed the Conductor of Train 208G5-06 at the home of NS's UTU Local Chairman. The Conductor explained he did not remember much about the collision due to a head injury received during the derailment. The complete report of interview is included with this report.

During FRA's investigation, NS provided a photograph of a cell phone allegedly found during their independent investigation. The cell phone was reportedly found within the accident wreckage by an NS manager. NS determined that the phone belonged to the Conductor of Train 208G5-06. NS maintained possession of the cell phone and FRA reviewed relevant cell phone records based on this information. The records did not indicate that a cell phone was in use when Train 208G5-06 received Track Authority Number 5619. FRA's investigation did not establish or rebut cell phone use as a contributing factor to the accident.

FRA's investigation revealed Train G23G5-07 was operating under Track Authority Number 5523 to proceed west from MP S100 to Tennille East. FRA's investigation revealed Train 208G5-06 received Track Authority Number 5619 to proceed east from Tennille East to Wadley with the instructions, "Do not depart until after the arrival of NS 1637 West (G23G5-07) at Tennille East."

OPERATING CREW -CONCLUSION: FRA interviewed both crews involved in the accident. Interviews did not reveal any pertinent information concerning probable cause. FRA's investigation and review of train movement records along with locomotive on-board camera footage revealed that the crew of Train 208G5-06 failed to remain clear holding the main line at East Tennille until the arrival of Train G23G5-07 as instructed on Track Authority Number 5619.

TRACK - ANALYSIS:

The track was constructed of 132-pound rail with wood crossties fastened by standard plates and cut spikes. MP 129.7 is located on tangent track with a 0.38 ascending grade and approximately 1,000 feet geographically west of a 2.8-degree left-hand curve. The DOTX219 FRA geometry car surveyed this section of track on February 19, 2015, with no exceptions found in the area of the derailment. FRA track personnel had inspected this section of track on July 30, 2015, eight days prior to the accident, with no exceptions identified in this area. NS track inspection reports were also reviewed and did not have any exceptions noted in the area. FRA's Track inspector did investigate this accident on-site and did not take any track exceptions during his investigation.

TRACK - CONCLUSION: Track conditions were not causal and did not play a role in this accident.

FATIGUE - ANALYSIS:

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 four employees involved in this accident.

FATIGUE- CONCLUSION: FRA concluded fatigue was not probable for the engineers and conductors assigned to the two trains.

MECHANICAL – ANALYSIS

The locomotive event recorders revealed that Train 208G5-06 was traveling at approximately 46 mph and Train G23G5-07 was traveling at approximately 40 mph when each train initiated an emergency brake application. The event recorders revealed the brake pipe pressures of each train dropped quickly from 90 psi to zero.

NS records revealed that on August 6, 2015, Train 208G5-06 received a Class 1 air brake test prior to departing origin terminal Austell, and the train's two locomotives were inspected with no noncomplying conditions noted. The crew of Train G23G5-07 indicated they completed a Class 1 air brake test before departing Midville. NS' records revealed that on August 6, 2015, the locomotive for G23G5-07 was inspected with no noncomplying conditions noted.

FRA's inspection and investigation did not reveal any mechanical conditions that would have been causal or contributing factors of this accident. However, FRA's investigation revealed that the Class 1 air brake test record for Train 208G5-06 was not properly executed. The train consist record for the train indicated 10 freight cars, while the brake test record indicated 7 freight cars. FRA's investigation did not reveal evidence to support failure of NS to brake test the three other freight cars in the train.

FRA's investigation also revealed that NS did not maintain the secondary record of information reported on Form FRA F6180.49A (blue card) for Locomotive NS 1637 (Train G23G5-07) and the copy of Form FRA F6180.49A required to be maintained in the cab of the locomotive could not be located at the scene of the accident.

Two violations were recommended for these offences.

MECHANICAL - CONCLUSION: Mechanical conditions were not a causal or contributing factor to this accident.

OVERALL CONCLUSION:

Investigation revealed that neither mechanical nor track were causal in this accident. In addition, crew fatigue was not probable and toxicology tests were negative. Review of train movement and authority records do show that Train 208G5-06 had received proper work authority, which included stopping at Tennille until Train G23G5-07 passed and was in the clear. Train 208G5-06 did not remain at Tennille East but proceeded to operate on the main track without proper authority.

PROBABLE CAUSE:

Probable cause of this accident was train crew operating Train 208G5-06 on main track, failure to comply with Track Authority.