



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

***Accident Investigation Report  
HQ-2019-1367***

***Norfolk Southern (NS)  
Atlanta, Georgia  
October, 4, 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 October 4, 2019, at approximately 11:10 a.m. EST, northbound Norfolk Southern Railway Company (NS) freight Train 187A103 (Train 1) derailed at NS Milepost (MP) 146.7 H on the NS Georgia Division, Atlanta Terminal District in Atlanta, Georgia. The method of operation is Traffic Control (NS Rule 261). The maximum authorized speed on the Inman Runaround Track is 35 mph for freight.

Train 1 was traveling at a recorded speed of 7 mph when the train experienced a penalty brake application and later went into an emergency brake application after an unknown car derailed. Once the air pressure was restored on the rear, Train 1 began to proceed again before an inspection was performed which subsequently led to an additional 32 cars derailing. There was a total of 33 derailed cars that came to rest with a majority of the cars laying against an embankment. Two of the derailed cars were empty hazardous materials Chlorine tank cars.

The weather at the time of the derailment was 96 degrees Fahrenheit. The conditions were sunny and clear with winds 3 mph from the north, 38% humidity and no precipitation.

There were no injuries to railroad personnel and none to the public. The damages reported by NS were estimated to be \$177,151 for equipment and \$300,646 for track, totaling \$477,797.

FRA determined the probable cause for the initial derailment was H503 – Buffing or slack action excessive, train handling.

FRA determined the contributing factors for the initial derailment were the following:

H514 – Failure to allow air brakes to fully release before proceeding (H005).

H521 – Dynamic brake, other improper use (H013).

In addition, FRA determined the contributing factors for the 32 additional cars that derailed were the following:

H305 – Instruction to train/yard crew improper.

H999 – Other train operation/human factors (Failure to comply with NS Rules 113 and L-245).

**TRAIN SUMMARY**

1. Name of Railroad Operating Train #1 Norfolk Southern Railway Company	1a. Alphabetic Code NS	1b. Railroad Accident/Incident No. 135725
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**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. 135725
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 10/4/2019	4. Time of Accident/Incident 11:10 AM
5. Type of Accident/Incident Derailment		
6. Cars Carrying HAZMAT 28	7. HAZMAT Cars Damaged/Derailed 2	8. Cars Releasing HAZMAT 0
9. People Evacuated 0		
10. Subdivision NORFOLK SOUTHERN CORPORATION - ATLANTA NORTH		
11. Nearest City/Town ATLANTA	12. Milepost (to nearest tenth) 146.7H	13. State Abbr. GA
14. County FULTON		
15. Temperature (F) 96 °F	16. Visibility Day	17. Weather Clear
18. Type of Track Main		
19. Track Name/Number Inman Runaround	20. FRA Track Class Freight Trains-40, Passenger Trains-60	21. Annual Track Density (gross tons in millions) 42
22. Time Table Direction North		
23. PTC Preventable Yes	24. Primary Cause Code [H503] Buffing or slack action excessi	25. Contributing Cause Code(s) H521, H514, H999, H305

**OPERATING TRAIN #1**

1. Type of Equipment Consist: Freight Train					2. Was Equipment Attended? Yes			3. Train Number/Symbol 187A103			
4. Speed (recorded speed, if available) R - Recorded 7.0 MPH E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 10957		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, J</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 (derailed, struck, etc.)		PROX 076794	152	no				0	0		
(2) Causing (if mechanical, cause reported)		N/A	0	no	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		e. Caboose
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	
(1) Total in Train	3	0	0	0	0	(1) Total in Equipment Consist	50	0	140	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	6	0	27	0	0
12. Equipment Damage This Consist 177151			13. Track, Signal, Way & Structure Damage 300646								
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: 2 Mins: 25		19. Conductor Hrs: 2 Mins: 25	
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 33.806082000				27. Longitude -84.475366000							

Wood Tabernacle  
Baptist Church



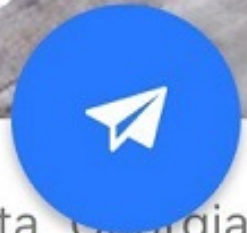
Atlanta  
School



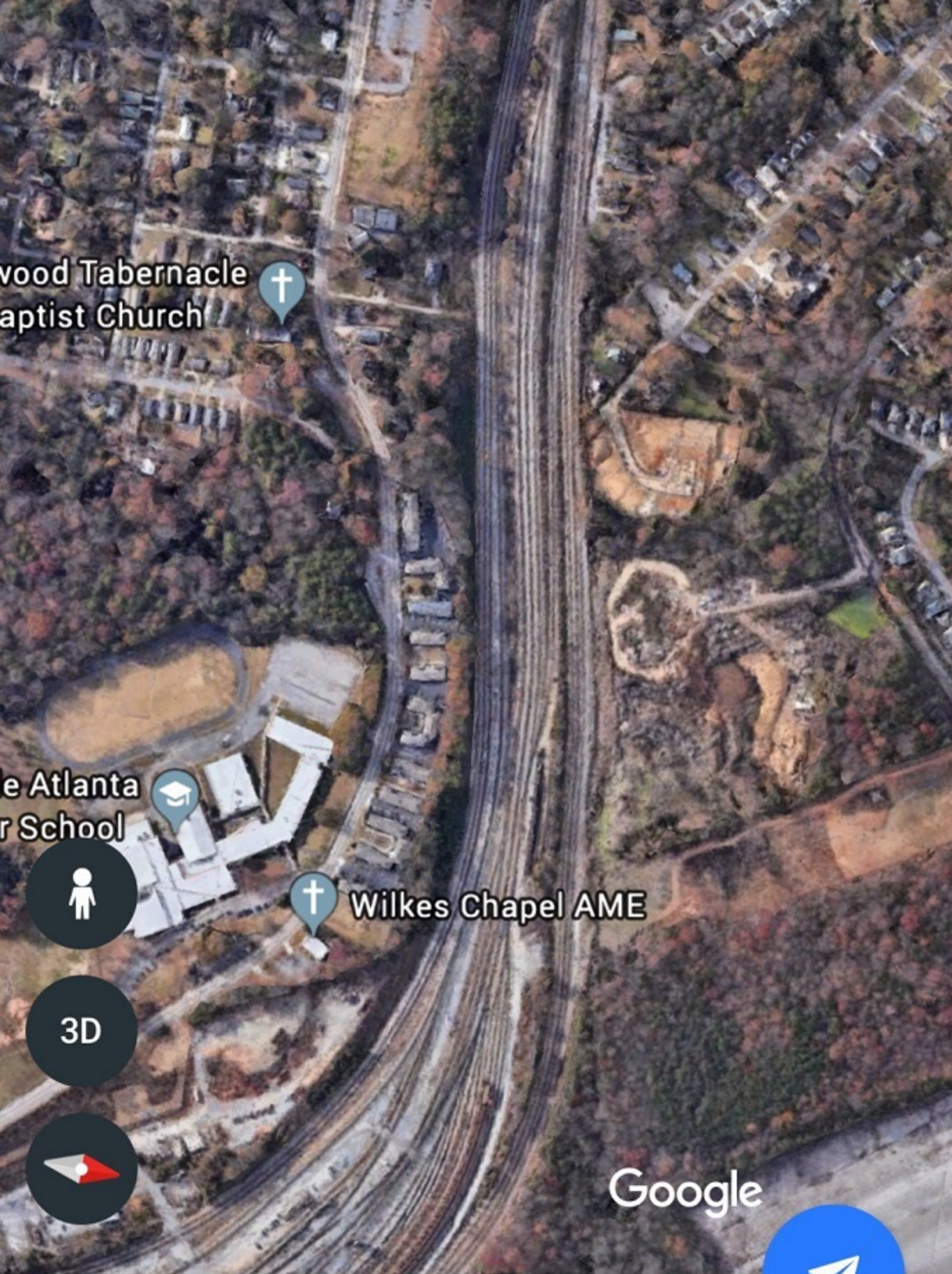
Wilkes Chapel AME



Google



X NS-Inman Yard Railroad company in Atlanta, Georgia



✕ NS-Inman Yard Railroad company in Atlanta, Georgia

Sketch - Sketch



**NARRATIVE****Circumstances Prior to the Accident**

Norfolk Southern (NS) northbound freight Train 187A103 (Train 1) consisted of three locomotives, 50 loaded cars, and 140 empty cars of various types. Train 1 was 10,958 feet long and had 10,957 trailing tons. On October 4, 2019, NS Train 187G203 operated from NS Brosnan Yard (NS MP 242 H) in Macon, Georgia to NS Inman Yard (MP 148 H) in Atlanta, GA. At Inman Yard, NS Train 187G203 was changed to Train 187A103, which is referred to Train 1 throughout this report. Train 1 had no change to the consist, received a new crew, and departed for Birmingham, Alabama.

The crew of Train 1 was comprised of an Engineer and a Conductor. The crew went on duty at 8:45 a.m. EST, October 4, 2019, at the NS Inman Yard, the away from home terminal for both crewmembers. They were called to operate Train 1 to their home terminal of Birmingham, AL. 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 at the time of the derailment.

NS mechanical personnel performed the required regulatory mechanical inspection and initial terminal train air brake test at the NS Brosnan Yard, with no exceptions noted. There were no special restrictions that applied to Train 1.

The derailment occurred on the NS Georgia Division, Atlanta Terminal District in Atlanta, GA. The Atlanta Terminal District operates in a north and south direction and consists of two main tracks and the Inman Runaround Track that is adjacent to the main tracks, as identified in the Atlanta Terminal District Timetable. Train 1 was operating on the Inman Runaround Track which has a maximum authorized speed of 35 mph for freight. The method of operation for this subdivision is Traffic Control (NS Rule 261).

Approaching the derailment site, in the direction Train 1 was traveling, from MP 149H to MP 146H there is a .46-degree descending grade. There are three left hand curves between MP 147.1H and MP 146.9H, then there is about 1,000 feet of tangent track before a 3.7-degree to 4.0-degree right-hand compound curve from MP 146.7H to MP 146.3H. Continuing north there is 1,000 feet of tangent track and then a 2.2-degree left hand curve at MP 146.15H followed by a 1.5-degree right hand curve at MP 145.99H. There is a private NS Inman Yard road crossing approximately 1,500 feet south of the point of derailment (POD).

The weather at the time of the derailment was 96° F. The conditions were sunny and clear with winds 3 mph from the north, 38 percent humidity and no precipitation.

**The Accident**

On October 4, 2019, the crew of Train 1 received a job briefing from the inbound crew of Train 187G203 and then attempted to depart NS Inman Yard. After traveling 370 feet, at 11:10:13 a.m., Train 1 experienced a PTC induced penalty brake application at the recorded speed of 7 mph, followed by an emergency brake application on a descending grade. Train 1 Engineer stated the PTC system put the train brakes on at a service rate (suppression) and then the train went into emergency (41 seconds later at 2 mph). After recovering the air brakes from the event, Train 1 Engineer contacted the PTC Help Desk



to report the PTC error (breaking due to fault detected) received and that he was having difficulties getting back into the PTC system. The PTC error message Train 1 reported to the PTC help desk was a common error message, and after several failed attempts to log back into the Interoperable Electronic Train Management System (I-ETMS) PTC Computer screen, the Engineer was instructed to operate without utilizing PTC.

Train 1's Engineer called the dispatch center to report the issues their train was having with the PTC Train Management Computer (TMC) and that the train was stopped by an emergency brake application. Train 1 Engineer told the dispatcher they had been cleared to proceed and operate without PTC by the PTC help desk and would let the dispatcher know when the pressure came back up on the rear of the train. Train 1's Engineer informed the dispatcher that NS Rule 113 required that the train be inspected by the Conductor after the emergency brake application. Under NS Operating Rules — January 1, 2019, Rule 113 - Train Inspection after an Emergency Brake Application:

(a) When a train is stopped by an emergency brake application, a visual inspection must be made of the train to ensure all wheels are on the rail, all equipment is in safe operating condition, and that the train is complete, as indicated by display of rear-end marker, before proceeding.

The on-duty NS Assistant Chief Train Dispatcher instructed the on-duty Dispatcher to tell the crew of Train 1 that, because the air pressure was coming back up on the end-of-train device (EOT), to not walk their train and proceed forward to Lithia Springs where a roll-by inspection would be performed by another train crew (NS Train 26A).

After receiving instructions from the dispatcher, Train 1 started to depart again. Train 1 traveled 297 feet and was stopped by a second emergency brake application when 32 cars derailed.

It is believed that a single car initially derailed because heavy dynamic braking, with brakes still applied to the rear of Train 1 while navigating curves on a slight gradient, caused exaggerated low speed in train forces to occur. This initial derailment would have occurred on the Inman Runaround Track (MP 146.7 H) at the north end of the NS Inman Yard, leading to the first emergency brake application. Once Train 1 started to proceed again, the additional 32 cars derailed, leading to the second emergency brake application. The derailed cars came to rest with the majority of the cars laying up against an embankment. Two of the 33 cars derailed were empty hazardous materials Chlorine tank cars.

Railroad wrecking contractors Hulcher Services and RJ Corman were called to the scene to clear the derailed equipment. There were no first responders on the scene. There were no injuries to railroad personnel and none to the public resulting from this derailment. The damages reported by NS were estimated to be \$177,151 for equipment and \$300,646 for track, totaling \$477,797.

The track was cleared and opened for traffic on October 4, 2019 at approximately 11:00 p.m.

### **Post-accident/Incident Investigation**

The Federal Railroad Administration (FRA) sent inspectors from the Operating Practices and Track disciplines to investigate the accident. The derailment site had been cleared of equipment and rail damages repaired prior to FRA arriving to the location.

FRA's investigators requested and received 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 – Toxicological Testing: This accident did not meet the criteria for Title 49 Code of Federal Regulations (CFR) Part 219, Subpart C, Post-Accident Toxicological Testing. The crew of Train 1 was not tested under FRA guidelines or company authority for reasonable cause for the use of alcohol or drugs.

Conclusion: FRA has no evidence that drug or alcohol use or impairment contributed to the cause or severity of the accident.

Analysis-Event Recorder Download / Train Handling: The lead locomotive NS 1199 was equipped with a speed indicator and an event recorder. The relevant event recorder data was downloaded by NS officials at the accident site and reviewed by FRA.

At 11:08:30 a.m., the Engineer of Train 1 released the brakes and began to depart Inman Yard, on the Inman Runaround Track. After moving 370 feet, at 11:10:13 a.m., the train experienced a penalty brake application at 7 mph due to an unstable I-ETMS PTC component (multiple faults). While in the penalty brake application, the Engineer transitioned into dynamic braking at 11:10:25 a.m. and increased the retarding effort to 100klbs. While the Engineer was working to recover from the penalty brake application, Train 1 experienced the first emergency brake application at 11:10:52 a.m. at 2 mph and stopped 2 seconds later (41 seconds after going into a penalty brake application).

At approximately 11:14 a.m., Train 1 began to recover the air on the rear of the train. Around 11:19 a.m., the Engineer starts to move the train while using dynamic braking until the second emergency brake application transpired at 11:25 a.m.

The locomotive event recorder analysis and other documents showed at the time Train 1 went into a penalty brake application and the subsequent undesired emergency brake application, the following conditions were present:

1. The slack in Train 1 was in the process of being stretched out (draft condition) when the PTC Fault codes caused the penalty brake application.
2. Train 1 was operating with a 90 lb. trainline but only had 56 lbs. of pressure at the rear of the train. With the trainline not being adequately charged, the Engineer did not have the ability to re-apply the airbrakes if needed to control the train's speed or stop. Train 1 failed to allow the air brake system to be charged within 15 PSI of the head end prior to departure. Under NS Rule L-245. USE OF TRAIN AIR BRAKE (g)(1)(c), the crew of Train 1 was required to "Charge air brake system to within 15 PSI of regulating valve or equalizing reservoir setting as indicated by a gauge at the rear of the train and wait at least 10 minutes before proceeding."
3. The in-train buff forces began to generate through Train 1 from the head end to the rear when the emergency brake application occurred due to the trainline not being fully charged causing the rear end of the train to run in to the head end.
4. The in-train buff forces were further increased when Train 1 Engineer elected to utilize dynamic braking after the penalty brake application which caused the retarding efforts to reach 100klbs.
5. The Train 1 tonnage graph and consist showed several cars equipped with cushion underframe draft gears and one short car among those derailed. The cars that derailed were lines 152-185 out of 190 cars: lines 152-154 were 73 feet long, line 153 (TTJX 81971) was equipped with a cushion under frame, and line 156 was a 46-foot covered hopper. After plotting Train 1's location on the track profile, FRA determined the approximate location of the train at the time the penalty brake application occurred,

followed by the subsequent first emergency brake application. Simultaneously, Train 1 was traversing in a curve with the rear third of the train consisting of 21 cars equipped with cushion underframe draft gears when the one car initially derailed.

6. It is believed that the Train 1's handling (buffing or slack action excessive), the train crew's failure to allow the air brakes to fully release, and the PTC induced penalty brake application in conjunction with the train's transition to dynamic braking likely caused exaggerated low speed in train forces to occur causing the one car to initially derail.

7. Pictures revealed rolled rail in the area of the derailed cars.

FRA believes Train 1's use of the throttle and dynamic brake had a tremendous effect on generating buff and draft forces as well as the slack action throughout the train. These are greatly influenced by the train's length, make-up, gradient, and the condition of the end-of-car cushioning devices between lines 152-185. When Train 1 began to move the train from the original stopping point at MP 145.2H, the Engineer began to stretch the slack out of the train while first advancing the throttle to notch 1 and later advancing the throttle to notch 2 just prior to the penalty brake application. At this time, the EOT pressure increased to 68 lbs. which was critical when the penalty brake application occurred (refer to NS-1 Rule L-245 b). The emergency brake application created a sling shot effect to the slack in the train. The slack action or in-train forces were exasperated throughout the train by the locomotive Engineer applying dynamic braking.

Furthermore, FRA believes Train 1's failure to comply with NS Rule 113, requiring the train be inspected by the Conductor after the emergency brake application is likely a causal factor of the severity of the accident. Train 1 was told they did not have to do an inspection after the first emergency brake application. Once the air pressure on the rear was restored, Train 1 proceeded again until the second emergency brake application occurred due to the additional 32 cars being derailed.

Conclusion: FRA determined the probable cause of Train 1's initial derailment was due to cause code H503 – Buffing or slack action excessive, train handling. FRA also identified multiple contributing factors: cause code H514 – Failure to allow air brakes to fully release before proceeding (H005) and cause code H521 – Dynamic brake, other improper use (H013). These factors likely caused the rear of the train to run into the head end generating enough lateral forces to lift a car off the outside rail in the curve.

In addition, FRA identified two additional contributing factors that caused the additional 32 cars to derail due to Train 1's failure to comply with NS operating rules: cause code H305 – Instruction to train/yard crew improper and cause code H999 -- Other train operation/human factors (Failure to comply with NS Rule 113 and L-245).

Analysis – Train Energy and Dynamics Simulator (TEDS) Simulation NS Train 187A103: A TEDS simulation was performed on the NS Train 187A103 derailment. The TEDS simulation illustrated an increased amount of buff force generated by a low speed penalty brake application, further aggravated by the Engineer's use of heavy dynamic braking. This evidence was also visible in Train 1's download before the first undesired emergency brake application. The simulation showed the highest buff force to have occurred near cars 90-100 in the train even though the cars that derailed was 152-185, which would have been entering a curve near MP 146H.

Conclusion: Although unconfirmable by the simulation, it's likely that car #152 derailed following the first

undesired emergency brake application. With that probable condition, the simulation shows resistance being generated while Train 1 begins to move after recovering from the first event. No excess power was generated on the second start due to the Engineer using dynamic braking to stretch the train on a descending grade of -0.5. However, movement continued when the throttle was applied as the following 32 cars were being derailed, which caused the train to come to its final stop when the second emergency brake application occurred.

Analysis- Positive Train Control (PTC) System: The track involved in this investigation is designated PTC territory. Prior to departure, any train/locomotive operating on such territory is required to be PTC equipped. In addition, the locomotive segment of PTC System must be initialized and transitioned to an Active State to provide the safety benefits of the PTC System. Review of the PTC System data logs revealed that at 11:03 a.m., the Engineer of Train 1 initialized the PTC System. The data logs also reveal that at 11:06:57 a.m., the PTC System had completed the initialization process and had transitioned to an Active State. The PTC System was operating as intended to provide normal PTC functionality and provided the normal PTC protection.

Review of the PTC System data logs revealed that at 11:10:03 a.m., the fault code 680 (EBI card fault) was detected. According to NS, this fault code is associated with a train horn circuit issue found on only a limited number of NS locomotives. The PTC System data logs revealed that between 11:09:46 a.m. and 11:10:40 a.m., there were multiple 702 fault codes associated with the TMC. The TMC consists of three (3) Central Processing Units (CPU 1, 2, and 3). By system design if more than one CPU is faulty, the PTC System will transition to a Failed State and a full-service penalty braking application is automatically applied in a fail-safe manner. In a Failed State the PTC system no longer provides any of the PTC functionality or protections.

Review of the PTC System logs also revealed that at 11:10:12 a.m., Train 1 was operating at 7 mph on the Inman Runaround Track when the PTC System transitioned to a Failed State. At 11:10:15 a.m., the train was then enforced by the PTC System. The head end of Train 1 was showing at MP 145.2 H and the rear of Train 1 was showing at MP 147.1 H. At 11:10:54 a.m., an emergency braking application was initiated for Train 1.

The I-ETMS PTC system was provided by Wabtec Corporation (Wabtec). Wabtec's analysis of event data logs, as recorded in NS trouble ticket No. 26223, stated the following:

Just prior to the 702 fault being detected by the PTC System, a 680 fault was received. FRA was informed that this is a known wiring defect on the NS EMD series locomotives. The two fault codes within a short time frame caused the PTC System to degrade from an Active State and transition to a Failed State. By design when the PTC system transition to a Failed State, the penalty brake is automatically applied in a fail-safe manner. This issue has since been addressed with Locomotive On-Board software release version 6.3.20 series.

Conclusion: FRA was able to determine that the initial penalty braking application was a result of the PTC System transition from an Active State to a Failed State caused by a Sync error with 2 of the 3 CPU's within the Train Management Computer and thus a full-service penalty braking application was initiated, as designed and administered in a fail-safe manner.

Analysis – Train Crew / Dispatch Center Performance: Based on the post-accident interviews with the crew of Train 1 and the analysis of event recorder data from the locomotives, FRA found the crew's

actions, as instructed by the NS Assistant Chief Train Dispatcher, to be noncompliant with NS Operating Rules 113(a) and L-245. The Train 1 crew notified the dispatch center their train was having issues with the PTC TMC and was in emergency. The on-duty NS Assistant Chief Train Dispatcher instructed the crew of Train 1 to not walk their train and to instead proceed forward to Lithia Springs. Under these instructions of the on-duty NS Assistant Chief Train Dispatcher, the Train 1 crew did not walk their train and therefore did not comply with NS Rule 113(a), which requires a train, after an emergency brake application, to be visually inspected to ensure all wheels are on the rail, all equipment is in safe operating condition, and the train is complete, as indicated by display of EOT. FRA's investigation revealed when that Train 1 went into the first emergency brake application there was likely a minimum of one wheel derailed that likely would have been discovered if the crew had conducted a walking visual inspection as required after the emergency brake application.

FRA also determined Train 1 Engineer's failure to comply with NS Rule L-245 - Use of Train Air Brake is likely a causal factor of the severity of the accident. After the first emergency brake application occurred, the Engineer failed to properly charge the air brake system and wait at least 10 minutes as required by Rule L-245.

Conclusion: FRA determined the crew of Train 1 contributed to the severity of the accident, which resulted in an additional 32 cars being derailed, after they were instructed by the on-duty NS Assistant Chief Train Dispatcher to move without inspecting their train and failed to properly charge the air brake system and wait at least 10 minutes before moving. (Cause codes H305 and H999.)

Analysis-Track: FRA obtained track inspection records from NS from October 2019 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.

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

Analysis – Motive, Power and Equipment: An FRA motive, power, and equipment (MP&E) inspector reviewed locomotive inspection reports for all locomotives (NS 1199, NS 9421, and NS 1201) and the train's Class 1 Airbrake Test documentation and found no exceptions.

Conclusion: There were no mechanical conditions or issues disclosed that contributed to the cause or severity of the derailment.

### **Overall Conclusions**

FRA determined that by design the PTC system disengaged and placed Train 1 into a full-service penalty braking application when the system experienced an internal fault. While in the penalty application the Engineer transitioned the train from power to dynamic braking. This action generated 100klbs of braking effort to a train that did not have a fully charged train line.

Train 1 had 21 of the train cushion underframe draft gear cars near the rear while negotiating a curve with a .46-degree descending grade. The rear of the train ran into the head end generating enough lateral forces to lift a car off the outside rail in the curve.

In addition, FRA determined the crew of Train 1 and the on-duty NS Assistant Chief Train Dispatcher were not in compliance with NS Rule 113(a). When the crew of Train 1 reported to the dispatch center the issues with the PTC TMC and their train was in emergency, NS Rule 113(a) should have been implemented. The on-duty NS Assistant Chief Train Dispatcher gave the crew of Train 1 instructions to

move their train forward to Lithia Springs. Unknown to all involved, a car was derailed at the time. This decision led to the severity of the additional 32 car derailment.

Also, FRA determined Train 1 Engineer's failure to comply with NS Rule L-245 - Use of Train Air Brake is likely a causal factor of the severity of the accident. After the first emergency brake application occurred, the Engineer failed to properly charge the air brake system and wait at least 10 minutes.

**Probable Cause/Contributing Cause**

FRA determined the probable cause for the initial derailment was H503 – Buffing or slack action excessive, train handling.

FRA determined the contributing factors for the initial derailment were the following:

H514 – Failure to allow air brakes to fully release before proceeding (H005).

H521 – Dynamic brake, other improper use (H013).

In addition, FRA determined the contributing factors for the 32 additional cars that derailed were the following:

H305 – Instruction to train/yard crew improper.

H999 – Other train operation/human factors (Failure to comply with NS Rules 113 and L-245).