National Transportation Safety Board

Office of Railroad, Pipeline and Hazardous Materials

Washington, DC 20594

RRD23LR008

TRACK AND ENGINEERING

Group Chair's Factual Report

April 6, 2023

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A. ACCIDENT

Location: Anniston, Alabama
Date: March 9, 2023
Time: 6:19 a.m. CST
<Enter HHMM coordinated universal time (UTC)>
Train: NS Train No. 245A109

B. TRACK AND ENGINEERING INVESTIGATOR

Group Chair Richard Hipskind
National Transportation Safety Board
Valparaiso, Indiana

C. SUMMARY

For a summary of the accident, refer to the Accident Summary Report in the docket for this investigation.

D. DETAILS OF THE INVESTIGATION

1.0 Background

Train 245A109**:**

On Thursday, March 9, 2023, at about 6:19 a.m. CST, a Norfolk Southern Railway Company (NS) train 245A109 was operating westbound (geographically west) on NS's East End District on a single main track at milepost 721.05 prior to it derailing. The train originated at Atlanta, GA and was destined for Birmingham, AL. The train contained 6 locomotives placed at the front of the train and 108 mixed manifest cars. There were 32 loads and 76 empties. The train weighed 7,758 tons (including locomotives) and was 9,769 feet long.

1.1 Track Description

The NS's East End District consists of 121.7 miles of single and double main track between milepost 671.0 and milepost 792.7. According to NS documentation, the 2022 total tonnage figure for the subject track between milepost 671.0 and milepost 792.7 was about 33.1 million gross tons.

On average there are 12 freight trains and three locals that operate daily over the East End District. Amtrak operates two passenger rail trains (one eastbound and one westbound) over this subdivision 7 days a week.

NS inspects and maintains the main track near the accident location to Federal Railroad Administration (FRA) Track Safety Standards (TSS) for Class 3 track, which allows for a maximum operating speed of 40 mph for freight trains and 60 mph for passenger trains; however, NS's Timetable No. 1 for the East End District identifies that between 719.4 and 721.9 all trains are restricted to a maximum speed of 35 mph. The accident occurred at MP 721.05. Amtrak operates 2 passenger rail trains (one eastbound and one westbound) over this subdivision 7 days a week.

Generally, the main track leading up to the accident location was constructed with crossties that measured 9-inches by 7-inches by 8-feet 6-inch long, spaced 20 inches on center (nominal). On the main track, the rail sections were 132 lb. continuous welded rails fastened to the crossties using standard double shoulder tie plates (18" x 7 ¾") fastened with 2 rail holding spikes on tangent track and box anchored every other crosstie are used to maintain gage and alinement of the track as well as restrain longitudinal movement of the continuous welded rail (CWR).[1] P1FHowever, on curve track, each tie plate has two additional anchor spikes and the crossties are fully box anchored. The track was supported by granite rock ballast.

Traveling on main track, the westbound train traversed a descending grade of 1.29%, beginning at milepost 719.8 to the point of derailment (POD) at milepost 721.05. The main track curvature leading up to the POD at milepost 721.05 was listed in the track chart as 3.5 degrees with 1 ½ inches of superelevation.

1.2 Point of Derailment (POD)

Investigators identified the point of derailment (POD) as a location on the south rail at about milepost 721.05. Investigators observed a wheel flange type signature departing the rail head and angling downward on the inside gauge corner of the rail head. Investigators also observed wheel flange type markings on the inside web portion of the south rail west of the POD marks indicating a continuation of the wheel flange type movement. The train was a westbound train. The "as found" condition of the south rail was that it had been 'rolled out' or 'rolled over'. Approximately ten feet west of the POD marks, investigators observed wheel flange type imprints on crossties. These markings appeared to be associated with a departure of wheels from the north rail. This area of the track became the consensus area of derailment.

[1] Continuous welded rail (CWR) means rail that has been welded together into lengths exceeding 400 feet.

Figure 2. View of POD.

Figure 3. View of wheel flange marks on crossties near the north rail.

2.0 Damages Estimates:

NS engineering personnel estimated the total track structural damages at $1.2 million. This figure includes costs for the installation of crossties, rail, associated ballast and track materials.

2.1 Post-Accident Inspection/Testing of Track

On March 11, 2023, track measurements were taken at marked stations on 15-foot 6-inch intervals beginning at about milepost 721.05 (at the POD) extending in the eastward direction to capture the track field notes for the final approach of the accident train. All the track geometry measurement figures are unloaded measurements. [Note: See section of Track Geometry Data wherein the track structure was measured by an NS geometry car on March 2, 2023, and those measurements were under load.]

Figure 4. Investigator taking gauge and crosslevel measurements.

Figure 5. Investigator measuring alignment (degree of curvature).

Figure 6. Investigator recording measurement values for track field notes.

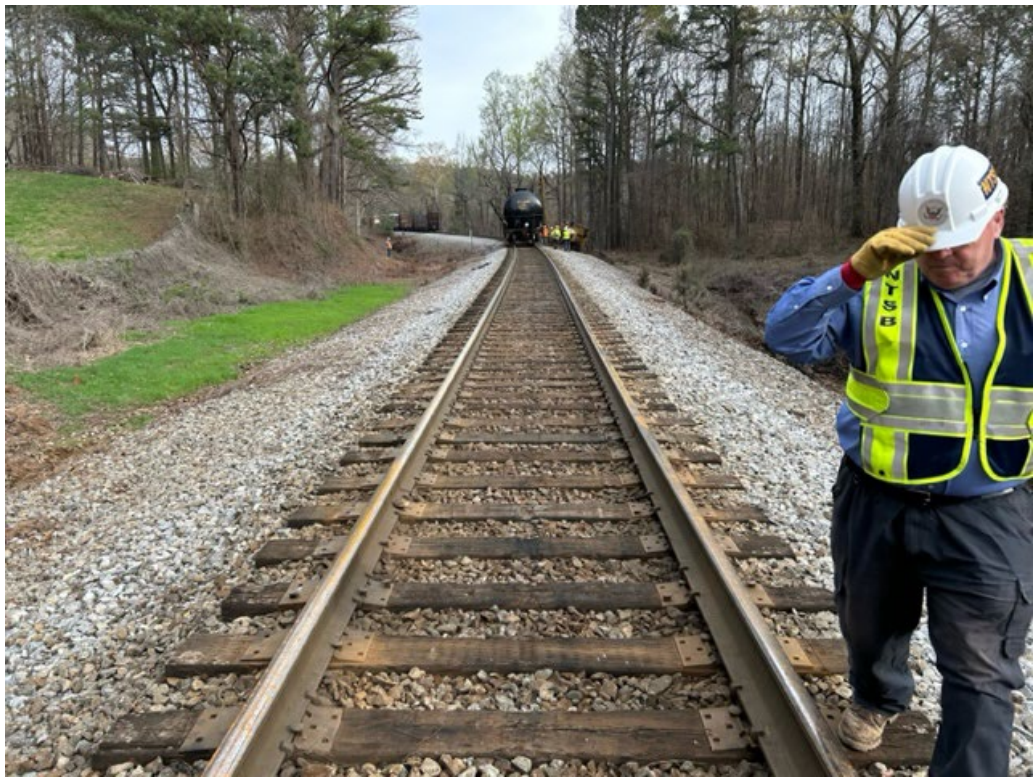

Figure 7. General view of the track looking eastward.

The track inspection field notes disclosed:

- The maximum measurement allowed for gauge in FRA Class 3 track, a maximum authorized speed of 60 mph for passenger trains is 57 3/4 inches. Investigators determined that the widest gage was 57 1/8 inches; or about 5/8 of an inch under the FRA maximum allowable limit. **Note:** The gauge measurement at POD was in disturbed track.

- The maximum allowable deviation from zero crosslevel at any point on tangent or reverse crosslevel elevation on curves may not be more than 1 ¾ inches for Class 3 track. Investigators determined from the field notes measurement data that there were no exceptions to this threshold.

Investigators measured the degree of curvature along with superelevation and determined that the curve's maximum operating speed using a 3 inch unbalanced was 43 mph for freight trains The curve is currently authorized for 35 mph.

This is the last segment of track that each train traversed prior to the POD.

2.2 Geometry Tests

FRA ATIP Car:

FRA operated their Automated Track Inspection Program (ATIP) vehicle DOTX 221 on NS's East End District on November 17, 2022, form Gainesville, GA to Anniston, AL (150.1 miles) with only one exception cited at milepost 668. There were no exceptions cited for the area under investigation.

NS Geometry Car Data:

NS geometry car NS-99 conducted a geometry measuring survey on March 2, 2023, (one week prior to the derailment) on their East End District. NTSB requested ten miles of that data for the track measurements between milepost 716 to 726. There were no exceptions noted for that portion of the East End District.

2.3 Rail Maintenance Grinding

According to NS the last rail grinding for the East End District took place on August 18, 2022.

2.4 Internal Rail Tests Data:

On February 23, 2023, an ultrasonic rail test was conducted on NS's East End District. Sperry Rail Service, Inc. conducted this inspection. No defects were recorded in the vicinity of the derailment. However, FRA took exception (for violations) with two rail inspection records regarding required information not provided (remedial action). Those exceptions were not within the derailment footprint.

3.0 Track Inspection:

FRA regulations found in 49 CFR 213 require that a rail carrier's track inspection records be prepared and signed on the day of the inspection for frequency of compliance with the Federal Railroad Administration Track Safety Standards (FRA/TSS). FRA track inspection records are required to reflect actual field conditions and deviations from the FRA TSS.

3.1 Regulatory Track Inspection History

On March 12, 2023, FRA and PSC safety inspectors reviewed track inspection records for the East End District that were examined from March 07, 2023, through December 1, 2022. The records show that the frequency of inspections is in compliance with federal regulations with the exception of two missing records for the main track. However, FRA had some additional records exceptions for sidings and switches wherein they denoted those exceptions for violation. Those exceptions were not within the derailment footprint.

The track in the area of the derailment was last inspected on March 7, 2023, by a NS qualified track inspector (T/I). The T/I noted no defects within the milepost range of the accident curve and the area that includes the derailment footprint.

On November 3, 2021, an Alabama Public Service Commission (PSC) track safety inspector conducted a track inspection of NS's East End District the area through the derailment site. The record, report No. 119, shows the 35 miles were inspected from Anniston, AL to Muscadine, AL and that six defective conditions were noted. Five of the six were tread wear at frogs in main track switches. None of the forementioned exceptions were within the derailment footprint.

An FRA track inspection activity record, dated June 21, 2022, shows the track was inspected from Muscadine, AL to Anniston, AL on NS's Gulf Division for their East End District. That report noted four exceptions. None of the exceptions were in the area of the investigation.

On March 11, 2023, an FRA Track Safety inspector performed a hy-rail and walking inspection of a portion of NS's East End District from milepost 719.30 to 720.0 that inspection generated report number 40, which denoted no defects. Also on March 11, 2023, both FRA and a PSC inspector walked the main track from milepost 721.30 to 722.30. No exceptions were noted on that report.

Submitted by:

Richard Hipskind
Railroad Accident Investigator, Group Chair

Parties to the Investigation - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this preliminary factual report for NTSB's accident investigation RRD23LR008 for the NS's train derailment conducted in Anniston, AL at milepost 721.05 is a factually accurate representation of the information collected during the investigation, to the extent of their best knowledge and contribution in this investigation. This version will be amended to include additional changes discussed during the initial preliminary factual review.

_____

_____//s//_____ Date 4/6/23

Richard A. Hipskind, NTSB

_____ Date _____

Nathan Wolfe, FRA*

_____ Date _____

Corwyn Foster, FRA*

_____//s//_____ Date 4/6/23

Roy Morrison, BMWE

_____ Date _____

Christopher Hester, PSC AL

_____//s//_____ Date 4/10/23

Justin Brooks, NS

*FRA as a Federal Agency does not typically "sign-off" on NTSB reports as part of their policy.