

# **NATIONAL TRANSPORTATION SAFETY BOARD**

**Office of Railroad, Pipeline and Hazardous Materials Investigations  
Washington, DC**

## **TRACK & ENGINEERING FACTUAL REPORT**

**DCA17FR011**

**CSXT Railroad, Derailment with Hazardous Materials Release and Fire**

**Hyndman, PA  
August 02, 2017**

### **Accident**

NTSB Accident Number:	DCA17FR011
Date of Accident:	August 02, 2017
Time of Accident:	4:54 a.m. (EDT)
Railroad Owner:	CSXT
Train Operator:	CSXT
Type of Train and No:	Q38831 (Mixed Freight/Hazmat)
Crew Members:	1 Engineer, 1 Conductor
Location of Accident:	Hyndman, PA

## Accident Summary

For a summary of this accident, refer to the *Accident Summary* report within this docket, DCA17FR011.



Figure 1. Aerial view of accident location.

## Track Description

This portion of the CSXT, the Keystone subdivision, consists of 87.1 miles of double main track, 2.7 miles of single main track between milepost BF 178.6 and milepost BF 268.4 with one passing sidings. On average, 30 trains per day traverse the subdivision. According to CSXT documentation, the 2016 total tonnage figure for the subject track between milepost BF 178.6 and milepost BF 268.4 was about 39.2 million gross tons.

CSXT inspects and maintains the main track on this portion of the Keystone Subdivision 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. Amtrak operates two passenger rail trains (one east bound and one westbound) over this subdivision seven days a week.

Traveling on main track No.2, the eastbound train traversed a grade ranging from 0.50 to 2.12 beginning at milepost BF 210.8 (top of grade) to milepost BF 192.3 (train resting location). From milepost BF 195.2 to the point of derailment (POD) at BF 193.82, the train was on a descending grade of between 1.65 and 2.08. At the point of derailment, the train was traversing an 8.33 average degree curve, with 3.25 average inches of super-elevation (outer rail of curve elevated above the inner rail of curve). The curve in which the POD existed has a permanent speed restriction of 35 MPH for passenger trains and 30 MPH for freight trains.

The crossties measured 9-inches by 7-inches by 8-feet 6-inch long, spaced 19.5 inches on center (nominal). The rails were fastened to the crossties using rail fastening plates fastened with one cut spike on the field and gage sides of each rail and two lag screws on the field and gage side of each rail. An elastic clip is used on the gage and field sides of each rail. These fasteners are used to maintain gage and alinement of the track as well as restrain longitudinal movement of the continuous welded rail (CWR).<sup>1</sup> The track was supported by granite rock ballast.

---

<sup>1</sup> Continuous welded rail (CWR) means rail that has been welded together into lengths exceeding 400 feet.

## Point of Derailment

The investigation team determined that the POD (the location where the normal wheel and rail interface was disrupted) was near milepost BF 193.82 on main track No.2.<sup>2</sup> Investigators identified a flange mark traversing over the top of the rail head of the high rail in the curve.<sup>3</sup> This flange mark was determined to be at about an 8-degree angle. Corresponding wheel departure marks were identified across the top of the rail head of the low rail of the curve. Investigators also photo documented flange and tread marks from the derailed rail car wheels that were found on various track components.

The POD existed about 1.5 miles west of the highway/rail grade crossing (Old Shellsburgh Road) where the additional rail cars departed the tracks. Old Shellsburgh Road highway/rail grade crossing (DOT145073M) is located at milepost BF 192.28. This crossing is in a compound left-hand curve. The west portion of this compound curve is 0.5-degree with 1-inch elevation and the east portion is 2.17-degree with 2-1/2-inches elevation.

Track note measurements taken near the POD revealed an average degree of curvature of 8.33 -degrees with about 3.25-inches of super-elevation in the accident curve. Based on FRA curve elevation and speed limitations (Vmax) the curve qualified to be

---

<sup>2</sup> POD GPS- Lat. N 39.83536 -W 078.75034

<sup>3</sup> The subject curve is a left-hand curve from an engineering perspective and a right-hand curve for the direction of travel of the accident train.

operated at 32.7 MPH for three-inch unbalance.<sup>45</sup> Track notes also revealed that the within the stations documented in the curve track gage was 57-1/2 inches.

The Track Group did not take exceptions to the gage, surface, alinement, or rail restraint effectiveness around the POD. No substantial rail movement was noted.



**Figure 2. Photo showing wheel flange departure mark across high rail in curve at POD.**

---

<sup>4</sup> Rail equipment is qualified for operating on track with a cant deficiency. This cant deficiency is referred to as the unbalance.

<sup>5</sup> Vmax is a formula that is based on the degree of curve, the super-elevation of the curve and the unbalance qualification of the rail equipment, calculates the maximum authorized speed for rail equipment to traverse a curve.



**Figure 3. Accident curve facing east toward direction of accident train travel.**

## **Damages Estimates**

As a result of the derailment, CSXT engineering forces installed two track panels on No. 1 track and six track panels on No. 2 track.<sup>6</sup> Less than 100 feet of rail had to be reseated in the plates. About 400 feet of No. 1 track east of the panels had superficial damage and CSX replaced about 100 track ties. The crossing also suffered superficial damage and was renewed following the accident. CSXT reported \$60,000 damages to the

---

<sup>6</sup> CSXT uses pre-built 40-foot track panels.

track structure. This does not include additional costs associated with environmental remediation efforts.

## **Post-Accident Inspection/Testing of Track**

On August 03, 2017, members of the track and engineering technical working group conducted a walking inspection from milepost BF 194.3 to milepost BF 193.5. FRA inspectors noted no deviation from FRA TSS. Investigators made the following general observations of the track structure:

- Track alinement was uniform
- Crosstie conditions meet requirements
- No track surface conditions were noted
- Rail fasteners were in place and secure
- Ballast and drainage conditions were acceptable
- Curve wear was noted on the high rail in the accident curve
- Rail in the accident curve was lubricated (rail flange lubricator located near milepost BF 194.5)



## **Track Testing and Inspection**

### **Geometry Tests**

CSXT conducted a survey with a track geometry vehicle twice in 2017 preceding the accident. The most recent survey was conducted on June 13, 2017. No defective geometry conditions were identified on the Keystone Subdivision during this survey. FRA conducted a survey under their Automated Track Inspection Program on May 05, 2017. This survey included main track No.2 through the accident area with no track geometry conditions identified within 60 miles of the POD.

### **Internal Rail Tests Data**

CSXT provided the last two ultrasonic rail test reports for the Keystone subdivision. The most recent test was conducted on July 21, 2017. There were no defective rail conditions identified in the area of the derailment.

### **CSXT Track Inspection Records**

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 FRA Track Safety Standards (TSS). FRA track inspection records are required to reflect actual field conditions and deviations from the FRA/TSS. CSXT has elected to operate at FRA Class 3 speeds in the accident area requiring CSXT personnel to inspect the main track at least twice per calendar week.



As part of the investigation, an FRA Safety Inspector conducted a records inspection of CSXT's track inspection records for May, June, and July, prior to the accident. The inspector noted seven exceptions finding that CSXT track inspectors failed to complete the required inspection report on the day of the inspection.

Main line inspection frequencies were met on the segment of track including the derailment area.

### **Regulatory Track Inspection History**

Prior to the accident, the last inspection by FRA Track Safety Inspector through the derailment area was conducted on June 27, 2017. Four deviations from FRA TSS were identified. The nearest to the accident area was a defective switch component at MP BF 190.2. The FRA inspector documented that this condition was protected by a CSXT employee with the placement of a speed restriction.

**[End of Report]**

Parties to the Investigation - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this report is a factually accurate representation of the information collected during the investigation, to the extent of their best knowledge and contribution in this investigation.

---

\_\_\_\_\_  
/s/  
Robert J. Gordon, NTSB

Date 12/19/17

\_\_\_\_\_  
/s/  
Christopher Schulte, FRA

Date 12/19/17

\_\_\_\_\_  
/s/  
David "Randy" Daniels, CSXT

Date 12/22/17