National Transportation Safety Board

Office of Railroad, Pipeline and Hazardous Materials Investigations

Washington, D.C., 20594

Derailment of X41518

CSX Transportation Key Train with Commodities

Alexandria, VA

May 19, 2018

Mechanical Group Factual

Accident

NTSB Accident Number:	RRD18MR007
Date of Accident:	May 19, 2018
Time of Accident:	7:02 a.m. (EST)
Type of Trains:	Key Train with Commodities
Railroad Owner:	CSX
Train Operator:	CSX
Fatalities:	0
Injuries:	0
Location of Accident:	Alexandria, VA

Group Members

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Accident Summary

For a summary of this accident see the *Accident Summary* located in NTSB docket, RRD18MR007.

Train Consist

CSX train X41518 consisted of three locomotives units at the head end, 167 cars (91 loads and 76 empties). It was 9,910 feet in length and had 14,394 trailing tons. The train was equipped with an End-of Train device. (EOT), serial number CSXE 04716 (calibration date October 24, 2017). The train was classified as a Key train with mixed commodities.[1]

Pre Accident Inspection

According to records in the cab of the lead locomotive, CSXT 5470, CSX train X41518 received an initial terminal inspection in Cumberland, Maryland on May 18, 2018. Records show that a total of 166 cars were tested in three different blocks before the train was made. An FRA Class I brake test was completed on May 18, 2018 with no exceptions recorded. There were no records provided to account for the difference between the cars tested (166) and the train consist (167).

Records Review

During the on-scene phase of this investigation, investigators collected the daily and periodic inspection records from all locomotives involved in the derailment. The daily inspection requirements are outlined in 49 *CFR* §229.21. The rule requires that; except for MU locomotives, each locomotive in use shall be inspected at least once during each calendar day. A written report of the inspection shall be made. This report shall contain the name of the carrier; the initials and number of the locomotive; the place, date and time of the inspection; a description of the non-complying conditions disclosed by the inspection; and the signature of the employee making the inspection.

Investigators reviewed the daily inspection record for the leading locomotive, CSXT 5470. The records were in compliance with the rule. The last documented inspection was dated May 18, 2018, at 8:45 p.m. at Cumberland, MD.

Periodic inspection requirements for locomotives are outlined in 49 *CFR* §229.23. Each periodic inspection is to be recorded on FRA form F6180-49A, or the blue card. At the first periodic inspection in each calendar year, the carrier shall remove from each locomotive Form F6180-49A covering the previous calendar year. If a locomotive does not receive its first periodic inspection in a calendar year before April 2nd, or July 3rd if it's a locomotive equipped with

[1] According to the Association of American Railroads (AAR) key trains are subject to speed restrictions and other operating criteria and includes any train with 20 car loads or intermodal portable tank loads of any combination of hazardous material (AAR 2016)

advanced microprocessor-based on-board electronic condition monitoring controls, because it is out of use, the form shall be promptly replaced. The Form FRA F 6180-49A covering the preceding year for each locomotive, in or out of use, shall be signed by the railroad official responsible for the locomotive and filed as required in 49 *CFR* §229.23(f). The date and place of the last periodic inspection and the date and place of the last tests performed under 49 *CFR(s)* §229.27, §229.29, and §229.31 shall be transferred to the replacement Form FRA F 6180-49A. The interval between any two periodic inspections cannot exceed 92-days unless the locomotive is equipped with advanced micro-processor based on-board electronic condition monitoring controls. The interval for these locomotive types is 184-days.

Investigators reviewed the periodic maintenance records for the leading locomotive, CSXT 5470, as well as CSXT 3142 & CSXT 7730. The records complied with the rule.

Wreckage Description

A review of the leading locomotive's event recorder showed the train was traveling at about 31 MPH and throttle in position 8 immediately before the derailment. At about 7:02 a.m., an un-commanded emergency brake was initiated. Investigators determined that the first car to derail in the consist was LEHX 1008, a covered hopper hauling concrete. It was the 42nd car in the consist.

Figure 1. LEHX 1008-first car to derail.

The train derailed at a failed roadbed on main track number 1 at mile post 102.85. As the train continued to pull south, derailed cars were damaging the concrete ties on the eastern or field side of the track.

Figure 2. Failed roadbed at MP 102.85

Run in forces caused at least one car to derail to the west of the track and as a result, MWCX 463382-the 56th car, wherein it collided with a bridge abutment north of one span of a two-span open deck through plate girder bridge causing it to collapse onto Norfolk Southern tracks running below.

Figure 3. Derailed cars on the north side of the destroyed bridge.

Figure 4. Derailed cars on the Norfolk Southern tracks.

A total of 31 cars derailed, the 42nd through the 66th (25 cars) and an additional 6-cars in positions 89 through 94 also derailed. The later derailment was a result of run in forces associated with the deceleration of the train and the fact that these cars were unloaded.

Figure 5. Photograph of secondary derailment.

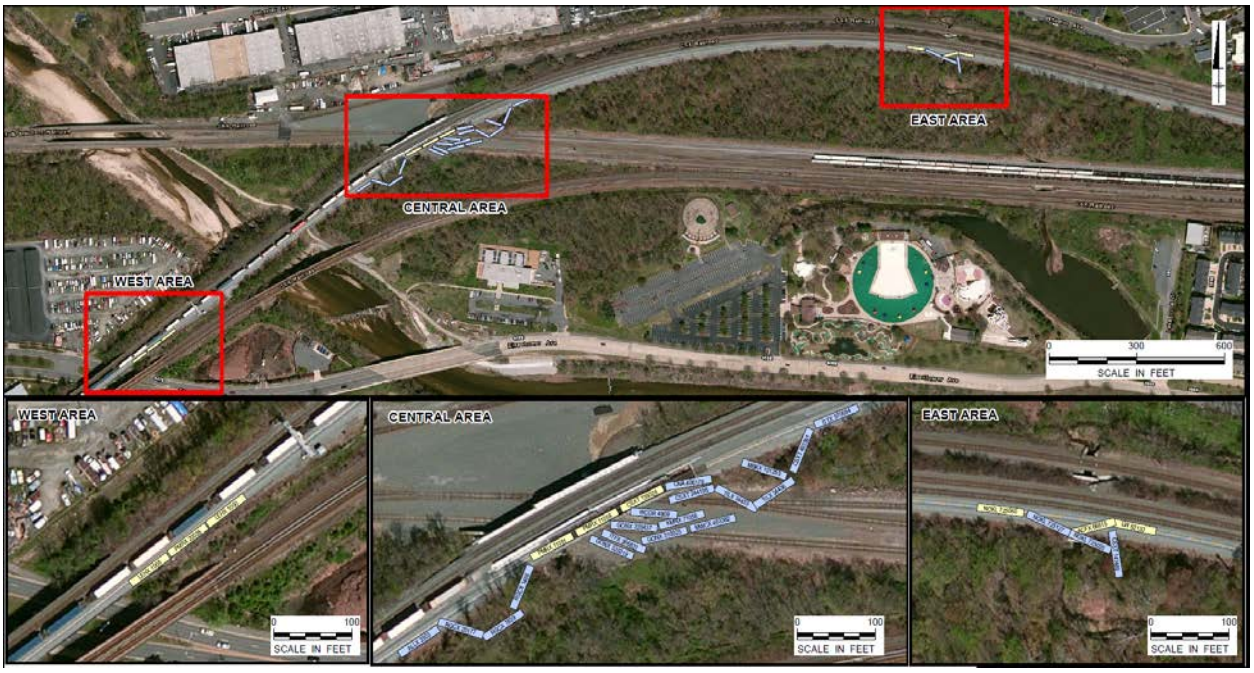

Figure 6. Derailment diagram.

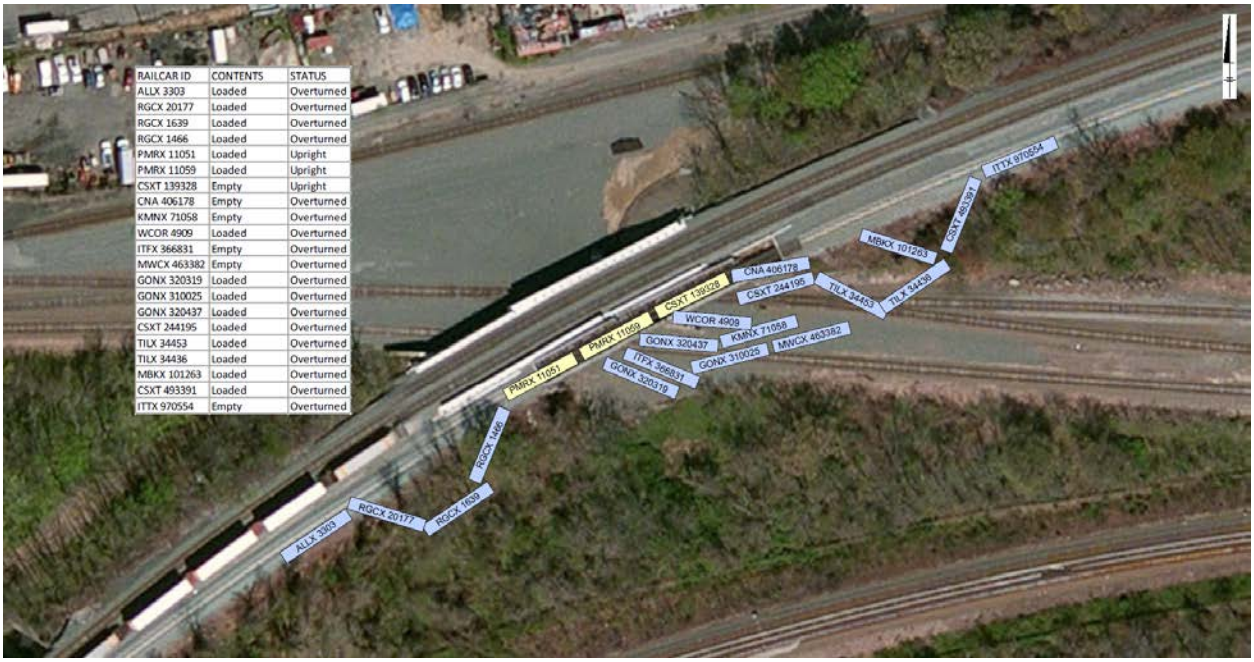

Figure 7. Derailment diagram - central area.

Equipment Post Accident Inspections

On May 19, 2018, the three locomotives pulling this train and 41-cars, were inspected at the point where they were repositioned near the derailment site. Investigators completed an FRA Class I brake test on these cars and observed no defects. All brake rigging appeared intact and

tread brake pads within tolerances. All wheels were observed be within federal requirements with no visible indications of wheel batter. Wheel batter is described as fresh impact marks to the wheel perpendicular to the wheel's tread. The wheel flanges and the wheel tread showed no indications of fresh wheel batter. Several wheels were however, observed to have small flats consistent with and emergency brake application.

On May 20, 2018, investigators coordinated with CSX to re-rail two of the six cars involved in the secondary derailment. Once completed, a consist of 91-cars was assembled so investigators could complete an FRA Class I brake test. Brakes did not function as designed on two of the 91-cars. CSX was notified of the condition.

Investigators examined the three cars involved in this derailment that came to rest upright and to the south of the derailment after they were re-railed (LEHX 1000, PRMX 20035 and LEHX 1008). All wheels were observed have full flanges and normal wheel tread wear with no apparent indication of a wheel break. All brake rigging appeared intact and tread brake pads were within tolerances.

Investigators examined the derailed cars, truck assemblies and wheel sets after the post recovery. All wheels examined were found to be intact with no breaks observed. Several wheels showed indications of damage consistent with derailment and post recovery.

Damage Estimates

CSX estimated accident costs are as follows:

- Car damages: $895,000
- Track: $200,000
- Bridge: Estimated to be between $5-7 million
- Total damages: Unknown at this time, but estimated to exceed $5 million

Attachments in NTSB Docket RRD18MR007

The following documentation was collected on-scene as part of this investigation and resides in NTSB docket RRD18MR007:

1. Train List
2. FRA Class I brake inspection records
3. FRA form F6180-49A Locomotive Inspection Record and Repair Record(s)-Daily inspection records (Locomotives CSXT 5470, 3142, 7730.)
4. Rear-End Train Device inspection/calibration record.