



**FEDERAL RAILROAD ADMINISTRATION**  
1200 New Jersey Avenue SE, Washington, DC 20590



**ACCIDENT FINDINGS REPORT**  
For  
**Derailment of CSX Transportation, Inc.'s Unit Crude Oil Train K08014**  
**Transporting Crude Oil for Plains All American**  
**Mount Carbon, West Virginia**

**October 9, 2015**

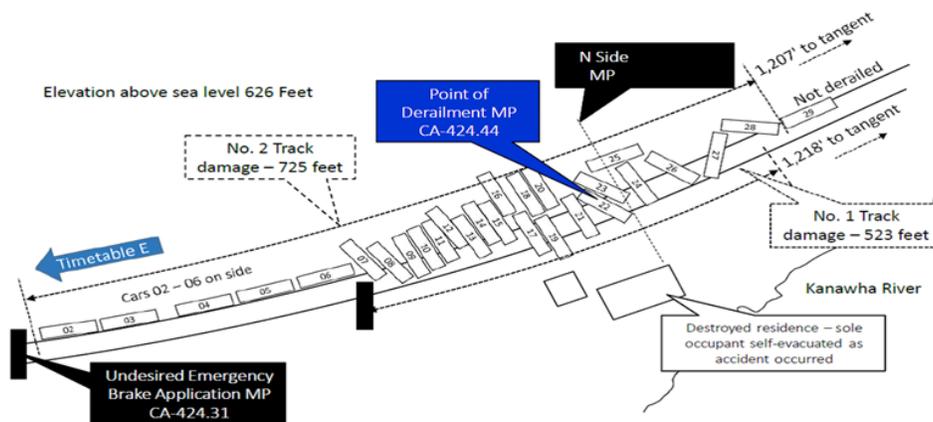
## ACCIDENT SUMMARY

On February 16, 2015, at 1:15 p.m. Eastern Standard Time (EST), eastbound CSX Transportation, Inc. (CSXT) Train K08014, transporting crude oil for Plains All American and operating on CSXT track, derailed west of Mount Carbon, West Virginia. The incident occurred on the CSXT Huntington Division, New River Subdivision, at Milepost CA-424.44. The derailment occurred when the train traversed over a rail with an internal defect, causing the rail to break.

Train K08014 was traveling at a speed of 33 mph, below the 50 mph maximum authorized speed for that segment. The train consisted of two engines, 107 fully loaded tank cars carrying crude, and two covered hopper buffer cars.

A total of twenty-seven tank cars derailed in the incident. Two tank cars were punctured, released crude oil, ignited, and caught fire. The fire spread quickly, resulting in a pool fire that eventually led to thermal tears in thirteen additional derailed tank cars. Ultimately, twenty-four of the twenty-seven derailed tank cars sustained significant damage in the incident and resulting fire. The fire injured one person (smoke inhalation), destroyed one home and one garage.

CSXT eventually determined the train released 378,000 gallons of crude oil during the incident—much of it lost to atmospheric burn, pool fires and ground absorption.



## RESPONSE

Following the derailment, the crew alerted the CSXT dispatcher of the train's condition and the fire. The engineer and conductor then separated the train, moving the two engines and one buffer car to a safe location. While awaiting emergency responders, the train crew directed motorists away from the accident site.

At 1:25 p.m., 10 minutes after the derailment, emergency responders arrived at the accident site, closed West Virginia State Route 61, and moved residents away from the incident.

Law enforcement and first responders later ordered a four-day evacuation within a half-mile of the incident site, affecting approximately 1,100 residents.

Approximately one hour after the derailment, at 2:30 p.m., West Virginia American Water treatment intakes were closed at Montgomery, West Virginia, as a precautionary measure.

## **INVESTIGATION**

With its technical expertise in railroad safety and investigating railroad accidents, FRA led an investigative team that included representatives from ten organizations.

The on-scene accident investigation team included experts from each of the FRA railroad safety disciplines: Operating Practices, Hazardous Materials, Signal & Train Control, Motive Power & Equipment, and Track. FRA's thorough investigation into the first four disciplines identified no factors that contributed to the derailment.

FRA's track investigation determined the cause of the Mount Carbon derailment was a broken rail.

## **RAIL FLAW**

Over the course of the weeks and months leading to the derailment, the low rail developed a flaw known as a vertical split head (VSH). A VSH is a longitudinal fracture in the upper part of a rail, used for supporting and guiding the wheels of railroad cars.

Prior to the derailment, two separate tests conducted by Sperry Rail Service (Sperry), a contractor hired by CSXT to detect rail flaws in the New River Subdivision, showed evidence of the VSH.

During a December 17, 2014, test, Sperry's test equipment recorded indications of a rail flaw at what would become the Point of Derailment (POD). A subsequent test, on January 12, 2015, noted a similar but more significant rail flaw indication at the same location. Despite indications of potential flaws, the Sperry operator failed to conduct a ground visual examination or hand tests to confirm the flaws as required. When asked by FRA investigators why he did not leave the cab of the test equipment to complete the required visual inspection, the operator stated his assumption that rough rail surface conditions, not a structural flaw, caused a positive test. Despite the Sperry operator's 15 years of experience on this CSXT territory, he had not receive the enhanced training given to new employees.

***FRA's assessment is that a vertical split head in the rail caused the rail to fail.***

## **FINDINGS**

1. The Mount Carbon derailment was preventable. Digital rail flaw test data records show indications of VSH defects at the point of derailment for two tests prior to the derailment (December 2014 and January 2015).
2. Following the digital indications noting potential flaws, neither the operator of the rail-flaw detection equipment nor CSX performed a visual inspection or hand test of the specified track.

3. The presence of a VSH in the railhead was a prime factor in the degradation of the rail structural integrity.

#### **RECOMMENDATIONS FOR CSXT**

- FRA recommends that CSXT routinely train operators of internal rail flaw detector cars so that they can more effectively identify and investigate non-valid testing locations and suspected rail flaws.
- FRA recommends that CSXT continue to use improved technology, which compares previous inspection data with data collected in real-time, increasing the likelihood of detecting rail flaws.
- FRA recommends that CSXT establish a plan to identify and replace track with VSHs or similar flaws on high-hazard flammable train routes, to reduce the risk of future derailments. The plan should be submitted to FRA for review.

#### **RECOMMENDATIONS FOR SPERRY**

- FRA recommends that Sperry work with the railroads to routinely train all operators to more effectively identify suspected rail flaws. This routine training will reduce the risk that a test operator fails to conduct a necessary hand test after digital flaw indications are received.
- FRA recommends that this training include review of previous digital rail flaw tests immediately before new testing is conducted and/or real-time comparison of previous results with current, incoming data so that operators can more accurately identify areas that should be hand tested.