Issued: October 13, 2026 Railroad Investigation Report: RIR-26-17

Canadian National Railway Train Derailment with Hazardous Materials Release and Subsequent Fire

Location	Glendora, Mississippi
Date	July 5, 2025
Accident type	Train derailment / hazardous material release and resulting fire
Train	Mixed freight train M30271-05
Track	Yazoo subdivision at milepost 97.63
Hazardous materials	Benzene
Fatalities	0
Injuries	0
Property Damage	$1.5 million

1 Factual Information

1.1 The Accident

On July 5, 2025, about 2:26 p.m. local time, a southbound Canadian National Railway (CN) mixed freight train derailed 22 railcars on the Yazoo Subdivision in Glendora, Mississippi.[1] One of the derailed railcars—loaded with a Class 3 hazardous material called benzene—breached and caught fire.[2] (See figure 1.) About 160 people

[1] (a) Visit ntsb.gov to find additional information in the public docket for this NTSB accident investigation (case number RRD25FR017), including detailed factual reports about the circumstances of the accident. (b) In the United States, some CN operations are consolidated under subsidiaries. In Mississippi, CN operates through the Illinois Central Railroad Company, a wholly owned indirect subsidiary.

[2] (a) *Benzene* is a highly volatile, colorless liquid classified as a Class 3 flammable liquid (UN 1114) that requires strict safety measures to manage severe fire risks alongside extreme health hazards during transport and storage. Further information can be found here. (b) Hazard Class 3 designates flammable and combustible liquids that can easily ignite or give off flammable vapors at relatively low temperatures.

were evacuated within a 1-mile radius of the accident. No injuries were reported among the public or the train crew. CN estimated damages to be about $1.5 million. At the time of the accident, visibility conditions were clear, and the weather was 90°F with no precipitation.



Figure 1. Derailment site. (Source: CN.)

On the day of the accident, key train M30271-05 departed Memphis, Tennessee, at 11:08 a.m., bound for Baton Rouge, Louisiana.[3] The train consisted of 139 railcars (59 loaded railcars and 80 empties), which included 23 hazardous materials tank cars and 11 residue railcars. Of the 23 hazardous materials railcars, 1 was loaded with compressed gas (refrigerant), 16 were loaded with benzene, and 6 were loaded with petroleum.

The train was traveling about 29 mph on a right-hand curve stretching about 1,785 feet when the accident happened. About 2:26 p.m., a train-initiated emergency brake application occurred near milepost (MP) 97.63.

When the train came to a stop, the crew conducted an inspection and found that 22 railcars had derailed, specifically railcars 29 through 50, with one railcar on fire. Of the 22 derailed railcars, 16 were empty, and 6 were loaded with Class 3 hazardous materials.

During response operations, it was confirmed that tank car UTLX 673342 was the single breached railcar and the only railcar involved in the fire. An evacuation radius of about 1 mile was immediately initiated, affecting about 160 people. Emergency responders, including local agencies and CN hazardous materials teams, worked

[3] A *key train* refers to any train containing 1 tank carload of poison or toxic inhalation hazard, anhydrous ammonia, or ammonia solutions; 20 carloads or intermodal portable tank loads of hazardous materials; or 1 or more carloads of spent nuclear fuel or high-level radioactive waste.

throughout the evening to continue to monitor and control the cooling of the breached tank car that was expelling burning contents.

The fire was extinguished around 11:30 p.m. on July 5, and the evacuation order was lifted shortly thereafter. CN contractors removed about 25,000 gallons of product from the breached benzene tank car. The product included both the material itself, and water used in firefighting activities.

1.2 Before the Accident

The curve was known to have recurring cross-level variation defects that required attention because of underlying soil instability. (See figure 2.) These defective conditions had been identified by the track inspector and through automated track inspections (ATI).[4] During interviews with the National Transportation Safety Board (NTSB), the track inspector reported that the curve had required surfacing about once per month to fix the recurring cross-level defects. Since this portion of the Yazoo Subdivision was constructed using continuous welded rail (CWR), it was subject to the requirements of Title 49 *Code of Federal Regulations* 213.118, which mandates that any track owner with track constructed of CWR must compose and comply with an FRA-approved CWR plan that contains written procedures covering installation, adjustment, maintenance, and inspection.

Because of the longstanding and recurring defects, a CN geotechnical team had been asked to assist in stabilizing the curve in 2024. The team visited the site February 1, 2024, and recommended four corrective actions:

1. installation of trench drains;[5]
2. construction of a shear key and granular bench berm about 325 feet long, 5–6 feet high, and 18 feet wide, intended to provide additional ballast-shoulder support;[6]

[4] An *automated track inspection* vehicle—often called a track geometry car—is a specialized rail car or locomotive equipped with lasers, cameras, and sensors. It tests and measures railroad track conditions, like track geometry, under the live weight and force of a moving train.

[5] A *trench drain* is a linear drainage feature designed to intercept, collect, and convey water to a stable outlet, thereby reducing erosion and sediment transport from sloped areas.

[6] (a) A *shear key* is a trench excavated into firm, undisturbed soil or rock at the base of a fill slope, berm, embankment, or retaining structure. It is then backfilled with compacted material to "lock" the new fill into the existing ground and resist sliding. (b) A *granular bench berm* is a bench or terrace excavated into an existing slope and filled with granular material such as gravel, crushed stone, or engineered aggregate. It is commonly used during slope stabilization to improve drainage and provide structural support.

3. undercutting the track to remove the hump and reestablish proper ballast shoulders; and
4. realignment of the track back to its original centerline, to be performed concurrently with undercutting.

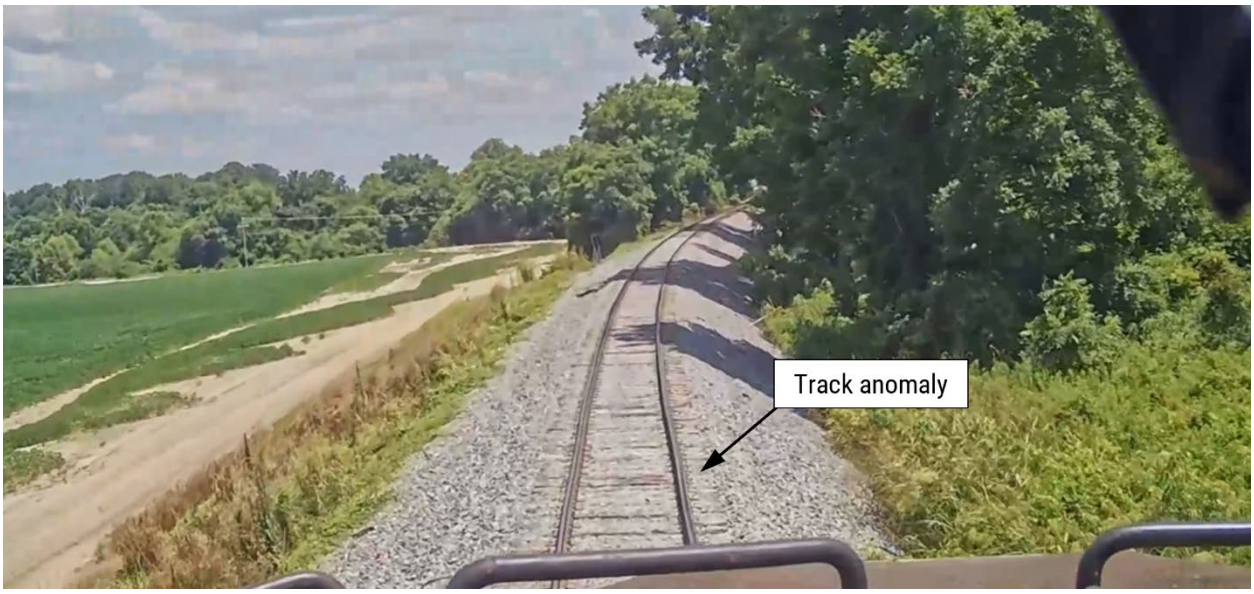


Figure 2. A forward-facing still frame from the accident train immediately before the derailment. (Source: CN.)

A few days before the accident, on July 2, 2025, a CN ATI vehicle identified two superelevation track defects at the curve between MP 97.5 and MP 97.7 (the location of the derailment). On July 3, 2025, a crew that included a track surfacing team foreman and tamper operator attempted to correct the defects through tamping and surfacing a portion of the defective curved track. Track surfacing activities were limited to a short section of track.[7] During interviews, the foreman and tamper operator provided differing estimates of the amount of track worked, ranging from about 435 to 600 feet, and both indicated that portions of the track were triple-tamped.[8] Post-surfacing verification that the track had been restored to a satisfactory state of geometry using appropriate track-measuring equipment was not carried out.

[7] Partial resurfacing of a track curve has the potential to weaken the structural stability of the entire curve.

[8] *Triple-tamping* in rail maintenance involves tamping the ballast three times to achieve maximum stone compaction and track stability Freshly laid or heavily disturbed tracks (such as tracks after complete renewal or ballast cleaning) have loose, unconsolidated stone layers. A single insertion may leave voids, but triple-tamping forces the ballast pieces to lock tightly together.

In accordance with CN operational guidelines, after the relief crew performed the remediation repair work in the curve, it placed a 10-mph speed restriction between MP 97.5 and MP 97.7 for the next two passing trains and then raised the speed restriction to 30 mph.[9] The NTSB's review of video footage from the first two trains to traverse the location post surfacing showed that the track anomaly in the body of the curve remained in the resurfaced segment and grew progressively with each train that passed.

At the time of the accident, the speed restriction of 30 mph was still in place for the segment of track on which the accident occurred. During interviews with the NTSB, the train crew stated they were aware of the 30-mph speed restriction and proceeded accordingly. The event recorder data confirmed that the train passed through the curve at 29.1 mph.

During the derailment investigation, the NTSB found that the geotechnical team's 2024 recommendations had not been fully implemented by maintenance-of-way personnel, although some measures appeared to have been taken to address the underlying soil instability and improve track conditions within the curve.

1.3 Postaccident Actions

During the week of July 21, 2025, the Federal Railroad Administration (FRA) conducted a focused inspection of the CN Yazoo Subdivision mainline between Memphis, Tennessee, and Greenwood, Mississippi. Activities included hi-rail inspections supplemented by walking inspections of the main track, mainline turnouts, and in-service sidings and by review of CWR records. The FRA identified a total of 206 defects, including 147 defects associated with CN's FRA-approved CWR plan. The most prevalent defects involved noncompliance with Title 49 *Code of Federal Regulations* 213.119(d), 213.119(j), and 213.118(a)(2), among others.

Many of the FRA's cited defects were linked to prior repairs such as rail installations, adjustment, repair, and stress-management activities that were not properly marked on the rail or documented as required by the CWR plan. Since the Glendora derailment, CN's senior management has stated that CN has completed several

[9] A slow order both protects trains from operating over a freshly disturbed track structure at full speed and provides time for the ballast and track structure to regain stability through traffic-induced compaction.

postaccident actions to ensure compliance with CWR plan requirements going forward.[10]

2 Analysis

In this accident, a CN mixed freight train derailed 22 railcars, and 1 tank car loaded with a Class 3 hazardous material breached and caught fire. The NTSB did not identify any evidence indicating that the train crew's operation of the train was a contributing factor in the derailment or subsequent fire. In addition, neither equipment condition nor compliance with hazardous materials transportation requirements contributed to the derailment at Glendora. The train's mechanical systems were functioning as intended before the event, and hazardous materials were properly prepared and secured for transportation.

Although the weather on the day of the accident was warm, outward-facing video footage retrieved from trains that passed over the curve provided no evidence that the anomaly in the curve was a track buckle caused by thermal stress. The ambient and rail temperatures recorded on the day of the accident were well below those typically associated with thermal buckling.

2.1 Preaccident Track Maintenance

The NTSB confirmed that the point of derailment was situated within the area surfaced by the CN crew on July 2, establishing a potential link between the maintenance activity and the failure location.

Interviews revealed that between 435 and 600 feet of the curve was surfaced and triple-tamped. Given that the curve is about 1,785 feet long, only a limited portion of the curve—roughly one-quarter to one-third—was resurfaced. The crew stated that, because of high outdoor temperatures, they believed it was preferable to tamp only enough track to remove the defects rather than to undertake a full-curve surfacing, because they believed disrupting more of the curve would make the curve more susceptible to a heat-related misalignment. The attempt to repair the defect through surfacing inadequately addressed the defect. Subsequently, the anomaly in the body of the curve worsened with each train that passed, as shown by the footage reviewed from other trains.

Although limiting tamping to the immediate defect area is normal practice during high-heat conditions, this curve's documented history of instability made a partial surfacing approach less effective. In this case, the approximate one-third of the curve

[10] CN senior management emails documenting specific actions taken to address future safety concerns since the Glendora derailment are available in the public docket.

where work was performed was left in less-stable condition than it would have been without the work because the disruption to the ballast caused the remaining two-thirds of the curved portion of track to remain rigid. This mismatch created a track stability transition point that was more susceptible to excessive track movement. The combination of vertical and lateral instability within this segment of the curve and the differing stiffness characteristics of the track structure likely increased dynamic wheel–rail forces as trains traversed the area. Under these conditions, wheel unloading and excessive rail movement caused a wheel flange to climb the gauge face of the rail and override the rail head, resulting in the initiation of the derailment.

2.2 Long-Term Track Issues

Although the preaccident track maintenance on July 2 played a direct role in the derailment, this curve was known to have recurring defects that required surfacing about once per month.

This curve was constructed of CWR, which has specific considerations associated with installation and maintenance compared with non-CWR rail. When rail is cut, installed, or adjusted without proper control of rail neutral temperature (the temperature at which rail is neither in tension nor compression) and stress equalization, imbalances in longitudinal force can develop. Over time, repeated maintenance activities involving the installation or removal of rail of unknown or unverified length may disrupt the uniform distribution of force on the rails. Repeated cycles of thermal expansion and contraction, combined with uncontrolled rail stress conditions, can result in progressive movement of the track off its originally engineered alignment and onto adjacent ground. In the case of the accident curve, the adjacent ground consisted of Yazoo clay, a soil known for its poor subgrade stability performance and susceptibility to movement under changing moisture and loading conditions.

Evidence indicates that the track within the curve at the accident location gradually migrated toward the inside of the curve over an extended period. As the track migrated, the west ends of the ties and the west rail increasingly lost the support and vertical stiffness provided by the engineered subgrade. Consequently, the west rail became more susceptible to vertical deflection under load and was unable to consistently maintain its intended elevation relative to the east rail. This condition contributed to recurring cross-level and superelevation defects, while the east rail remained comparatively stable because of continued support from the underlying engineered subgrade. Because the underlying support deficiency was gradual and not readily apparent, remediation efforts focused primarily on correcting the observable geometry defects rather than the underlying loss of subgrade support. The recurring cycle of surface corrections and localized repairs addressed the symptoms but not the

underlying causes of the track defects and allowed conditions in the curve to progressively deteriorate.

Because of the specific considerations associated with installing and maintaining CWR, federal regulations require track owners to have an approved CWR plan that contains written procedures covering installation, adjustment, maintenance, and inspection. In this investigation, the NTSB found that in the years preceding the derailment, CN engineering personnel did not consistently comply with the railroad's CWR plan requirements for the section of track involved in the accident. Specifically, the NTSB identified numerous instances in which required records associated with rail-adjustment activities were incomplete, inaccurate, or unavailable. These deficiencies included the missing or inaccurate documentation of rail plug installations, rail temperatures at the time of adjustment, the amount of rail added to or removed from the track, and rail temperature differentials from before and after maintenance activities.

The purpose of CWR plan requirements is to establish and maintain awareness of the rail neutral temperature. Without reliable records of rail-adjustment activities, engineering personnel could not accurately determine the effects of prior maintenance on rail stress conditions or identify when corrective rail adjustments were necessary. As a result, CN lacked an effective means of monitoring and managing rail forces within the track structure. This deficiency prevented engineering personnel from maintaining an accurate understanding of rail neutral temperature and stress conditions within the track. Consequently, rail stresses were allowed to accumulate and redistribute unchecked, contributing to progressive track migration toward the inside of the curve, shifting the load-bearing structure off the hardened subgrade, and degrading overall track stability.

3 Probable Cause

The National Transportation Safety Board determines the probable cause of the July 5, 2025, train derailment in Glendora, Mississippi, was wheel climb caused by a track curve deformity that remained unsafe following Canadian National Railway's attempted repair of the identified defect. Contributing to this accident was Canadian National Railway's failure to properly remediate the causes of the repeat defects in this curve, as identified by their geotechnical team, or to maintain their continuous welded rail in accordance with the established continuous welded rail plan, which led to the progressive loss of track stability.

4 Lessons Learned

This accident demonstrates the importance of strict adherence to a comprehensive and well-developed CWR plan, supported by ongoing auditing and verification under the direct onsite supervision of qualified personnel. The investigation further revealed that inadequate project management allowed a known safety concern

to persist without effective corrective action until an accident occurred. Maintaining a complete and current CWR plan, conducting continuous oversight and auditing, and ensuring qualified project management are essential to identifying and addressing track anomalies before they cause accidents.

Since the accident, CN conducted audits of available track condition data and identified four additional curves displaying patterns like those observed in the Glendora derailment. These curves were surveyed to determine whether the track had migrated off its intended alignment, including potential movement into the body of the curve and away from the original soil hardpan foundation, and remediated by CN.

CN also executed a rail-destressing program on the Yazoo Subdivision to reestablish proper CWR management. The program involved cutting rail, measuring, and documenting CWR temperatures to establish an accurate baseline, and resetting the CWR program. As part of this effort, managers are required to be onsite to ensure the work is performed correctly and to reinforce managerial understanding of proper CWR procedures. This direct involvement is intended to strengthen frontline management's ability to guide crews in following the CWR plan and to accurately audit and verify CWR-related work going forward.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the NTSB Case Analysis and Reporting Online (CAROL) website and search for NTSB accident ID RRD25FR017. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting—

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