Lessons from the East Palestine Train Derailment

21st May 2026 ▸ CHEMUK, NEC, UK

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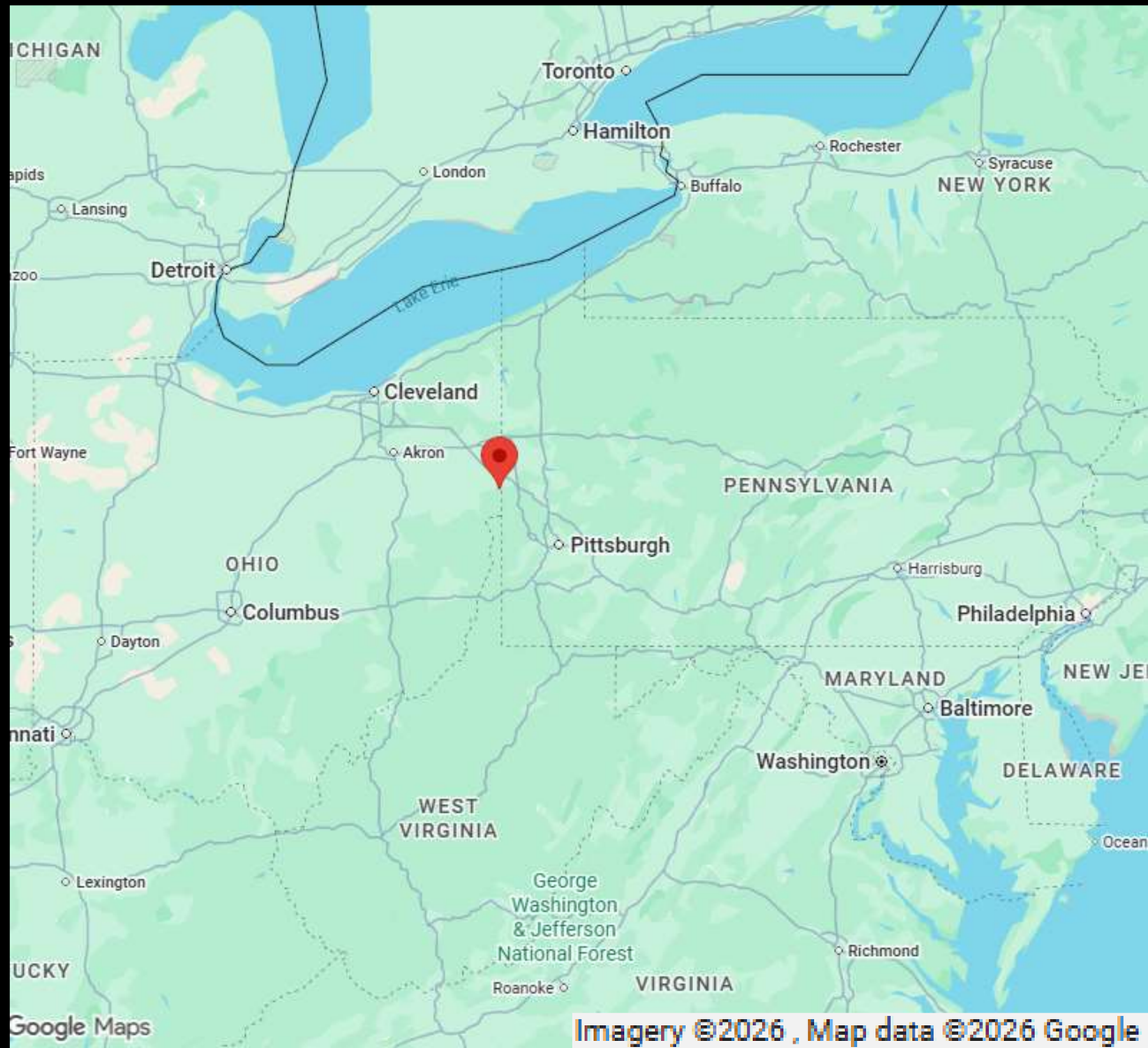
▸ *Prepare. Respond. Recover.*

East Palestine Derailment

On 3rd February 2023, a freight train derailed in East Palestine, Ohio, due to an overheated axle bearing.

The train consisted of 150 cars:

- 38 derailed.
- 11 derailed cars carried Dangerous Goods (DG).
- 5 derailed tank cars carried Vinyl Chloride Monomer (VCM).
- Other DG involved: ethylene glycol, ethyl hexyl acrylate, butyl acrylate, isobutylene, and benzene residue



East Palestine Derailment

- 3 cars of flammable/combustible DG are breached.
- Fire involves 35 cars, including all 11 derailed cars carrying DG.
- East Palestine Fire Department (EPFD) sets a 1-mile evacuation zone affecting ~ 2,000 residents.
- It takes nearly 1 hour for incomplete verbal information on DG to reach EPFD.



National Transportation Safety Board Railroad Investigation Report RIR-24-05 (Courtesy of Eric's Train Yard)

East Palestine Derailment

- The 5 VCM tank cars were not breached.
- 4 were exposed to fires and released VCM from Pressure Relief Devices (PRD).
- Releases from PRD ceased in the afternoon.
- 2 days later the train operator informs the Incident Commander (IC) that polymerisation could lead to BLEVE[1] and recommends to “vent and burn” all 5 VCM tank cars.
- IC expands the evacuation zone and the “vent and burn” is carried out.
- A column of black smoke containing soot, CO_2, CO, HCl, and a trace of phosgene grows into a persistent cloud.



National Transportation Safety Board Railroad Investigation Report RIR-24-05 (Courtesy of NS)

[1]BLEVE: Boiling Liquid Expanding Vapour Explosion

Impacts & Consequences

- Persistent reports of respiratory issues, fatigue, and headaches from residents to this day.
- Health assessments across multiple States required for years.
- Local businesses loss of revenue.
- 25 million gallons of water contaminated and 80,000 tons of soil needed removal.
- Environmental monitoring of air, soil and water across multiple States required for years.
- Emergency response and clean up costs.
- Legal liabilities and lawsuits.

In total, the train operator estimates that it will spend more than $1 billion to address the contamination caused by the East Palestine derailment and improve rail safety and operations.

VCM Vent & Burn

- Convinced that VCM is polymerising and will lead to catastrophic explosions, the train operator and its contractors believe that a vent and burn of the VCM is the only option.
- The shipper/manufacturer tells the train operator that polymerisation is not occurring and this should not be the justification for vent and burn.
- The train operator tells the Incident Commander that to avoid catastrophic explosions due to polymerisation, the vent and burn is the only option.
- The train operator does not tell the Incident Commander that the manufacturer said that polymerisation was not occurring.
- Being given only 13 minutes to make a decision and in the absence of any objections from Unified Command, the Incident Commander agrees to the vent and burn.

East Palestine Derailment

- Underscores the necessity for robust emergency planning in the chemical sector.
- Highlights the need for comprehensive risk assessments, preparedness training, effective communication, and on-going regulatory compliance.
- By prioritizing these elements, the chemical industry can better safeguard public health and the environment, reducing the likelihood and impacts of future chemical emergencies.



Planning

- Be stringent with regulatory compliance (TDG, equipment design, maintenance and certification)
- Review your information sources, a Safety Data Sheet written for the user may contradict the information you provide during transport incidents.
- Consider reaching out to emergency responders who may have less experience with DG incidents.



Response

- Establish a direct line of communication with the Incident Manager.
- Be careful about confirmation bias.

“the tendency to gather evidence that confirms preexisting expectations, typically by emphasizing or pursuing supporting evidence while dismissing or failing to seek contradictory evidence” (American Psychological Association 2018).





Final Thought…

This incident has changed the landscape of hazardous materials incidents.

Regardless of where your product is and what your understanding of ownership is during its life cycle, even if it’s not your incident but it’s your product, do you, should you, would you want to be involved in the response?

Thank You!

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- Prepare. Respond. Recover.

Any further questions?

Please come see us at B142.

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