



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

**Safety Advisory Notice for Tank Cars Equipped with Aluminum Manway Protective Housing
Covers**

**U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
Office of Hazardous Materials Safety**

Why PHMSA Wrote This Safety Advisory Notice

In light of the recent train derailment incident in East Palestine, Ohio, the Pipeline and Hazardous Materials Safety Administration (PHMSA) seeks to alert hazardous materials (hazmat) tank car owners and offerors of the potential for certain manway assemblies with aluminum protective housing covers to melt when exposed to extreme heat as experienced in a pool fire situation. While the National Transportation Safety Board (NTSB) investigation into the derailment incident is ongoing, PHMSA issues this Safety Advisory to encourage all hazmat tank car owners and offerors to survey their fleets for any tank cars currently equipped with aluminum protective housing and consider replacing this equipment with carbon steel housings, which we understand to be current industry practice.

PHMSA and the Federal Railway Administration (FRA) may take additional action in the future if investigations reveal that the destruction of the aluminum manway covers and presence of melted aluminum inside the protective housing significantly contributed to improper functioning of the pressure relief devices.

Disclaimer: This Safety Advisory is considered guidance pursuant to DOT Order 2100.6A (June 7, 2021). Except when referencing laws, regulations, policies, or orders, the information in this Safety Advisory does not have the force and effect of law and is not meant to bind the public in any way. This document does not revise or replace any previously issued guidance.

Background and Recent Incident

On February 3, 2023, a mixed-consist freight train operated by Norfolk Southern Railway—comprised of two head-end locomotives, 149 railcars, and 1 distributed power locomotive—derailed in East Palestine, Ohio. Thirty-eight railcars derailed, including 11 tank cars carrying combustible liquid and flammable gas hazmat. The derailment resulted in a fire impacting the derailed tank cars and damaging 12 additional railcars that were not derailed. Included in the derailment and fire were five DOT-105 specification tank cars containing vinyl chloride—a hazmat classified as a Division 2.1 flammable gas. These DOT-105 specification tank cars were not punctured in the derailment. On February 6, responders conducted a controlled release of the contents of these tank cars to vent pressure to prevent an explosion.¹

The NTSB is leading the investigation into the East Palestine, Ohio derailment and fire—including the emergency response—with support from PHMSA, FRA, and other parties with expertise in railroad operations, tank cars, and hazmat. During the initial investigation of the scene of the derailment, the NTSB advised the U.S. Department of Transportation that 3 of the DOT-105 specification tank cars containing vinyl chloride were equipped with manway protective housing covers constructed of aluminum. The primary function of a manway

¹ See NTSB Preliminary Report RRD23MR005 for further details of the East Palestine, OH derailment. <https://www.nts.gov/investigations/Pages/RRD23MR005.aspx>

protective housing and cover is to protect tank car fittings, such as pressure relief valves and other fittings, from damage. The NTSB's March 2, 2023 Investigative Update indicates that the aluminum covers melted or were consumed during the fire, and melted aluminum was observed around the valves inside the protective housing. The investigation has yet to determine what impact, if any, the destruction of the manway protective housing covers and presence of melted aluminum inside the protective housing had on the performance of the pressure relief devices of the DOT-105 specification tank cars containing vinyl chloride or whether the loss of the covers allowed for excessive flame impingement damage to the fittings.

Safety Advisory

In light of the NTSB's update regarding its plans to transport the manway assemblies and examine the pressure relief valves, PHMSA, in consultation with FRA, is issuing this safety advisory to inform and caution hazmat tank car owners and offerors regarding the survivability of the aluminum protective housing covers, such as those that are subject to investigation related to the Norfolk Southern derailment. Although it is currently unclear what impact the protective housing covers may have had on the severity of the damages resulting from the derailment, PHMSA is concerned that the melting of these covers may present a danger in pool fire situations. Therefore, PHMSA requests that all tank car owners and offerors review their fleets to determine whether their tank cars are equipped with aluminum manway covers. Any tank car owners and offerors that have such tank cars should take into consideration whether this equipment, or the service equipment within the protective housing, can withstand the effects of fire exposure, including the effects of a prolonged pool fire—and should consider replacing this equipment with carbon steel, which we understand to be current industry practice. PHMSA has observed in other accidents that carbon steel protective housing covers survive pool fire

incidents better than aluminum covers, likely due to carbon steel having a higher melting point than aluminum.

Future Actions

PHMSA and FRA may take additional action in the future if investigations reveal that the destruction of the aluminum manway covers and presence of melted aluminum inside the protective housing significantly contributed to improper functioning of the pressure relief devices.

Issued in Washington, D.C., on March 2, 2023.

A handwritten signature in blue ink that reads "William S. Schoonover".

William S. Schoonover,
Associate Administrator, Office of Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration.