



Office of the Chairman

National Transportation Safety Board

Washington, DC 20594

July 12, 2016

The Honorable Marie Therese Dominguez
Administrator
Pipeline and Hazardous Materials Safety
Administration
Washington, DC 20590

Dear Administrator Dominguez:

Thank you for your May 4, 2015, letter to the National Transportation Safety Board regarding Safety Recommendations R-12-5 and -6; R-14-4, -6, and -14; and R-15-14 through -17. We issued Safety Recommendations R-12-5 and -6 on March 2, 2012, as a result of our investigation of the June 19, 2009, derailment of a Canadian National freight train at a highway-rail grade crossing in Cherry Valley, Illinois.

R-12-5

Require that all newly manufactured and existing general service tank cars authorized for transportation of denatured fuel ethanol and crude oil in Packing Groups [PGs] I and II have enhanced tank head and shell puncture resistance systems and top fittings protection that exceeds existing design requirements for [Department of Transportation] DOT-111 tank cars.

We note that your final rule, *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains* [HHFTs] (HM-251), published at 80 *Federal Register* 26644 (May 8, 2015) and effective July 7, 2015, requires increased head and shell material thickness to 9/16 inch, full height 1/2-inch-thick head shields, and 11-gauge jackets, all to improve puncture resistance. We commend your decision to require the retrofit standard be applied to tank cars carrying all flammable liquids in HHFTs, and not only to ethanol and crude oil in PG I and II. These actions satisfy the intent of Safety Recommendation R-12-5, which is classified “Closed—Acceptable Action.”

R-12-6

Require that all bottom outlet valves used on newly manufactured and existing non-pressure tank cars are designed to remain closed during accidents in which the valve and operating handle are subjected to impact forces.

We are pleased that HM-251 requires bottom outlet valve protection for the DOT-117 tank car, including performance and retrofit standards, in sections 179.202-8, 179.202-12(e), and 179.202-13(g), specifically that all bottom outlet handles must either be removed or designed to prevent unintended actuation during derailment scenarios. These provisions satisfy the intent of Safety Recommendation R-12-6, which is classified “Closed—Acceptable Action.”

We issued Safety Recommendations R-14-4 and -6 on January 23, 2014, as a result of a train derailment in Lac-Mégantic, Quebec. Sixty of the 63 derailed DOT-111 tank cars released about 1.6 million gallons of crude oil. Some of the spilled oil ignited immediately. The fire engulfed the derailed cars and the surrounding area. Forty-seven people died as a result of the fire, and nearby structures were destroyed or extensively damaged. About 2,000 people were evacuated from the surrounding area.

R-14-4

Work with the Federal Railroad Administration [FRA] to expand hazardous materials route planning and selection requirements for railroads under Title 49 *Code of Federal Regulations* 172.820 to include key trains transporting flammable liquids as defined by the Association of American Railroads Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas.

We are pleased that HM-251 expands the applicability of route planning and selection requirements to HHFTs in section 172.820. The revised regulation requires rail carriers operating HHFTs to complete the initial process of compiling commodity data by March 31, 2015. Rail carriers operating HHFTs must then analyze the safety and security risks for the transportation route(s) identified in the commodity data. In performing the analysis, the rail carrier must seek relevant information from state, local, and tribal officials, as appropriate, regarding security risks to high-consequence targets along or in proximity to the route(s) used. For each calendar year, the rail carrier must identify practicable alternative routes over which it has authority to operate and perform a safety and security risk assessment to compare the routes using the criteria in appendix D to Part 172. The carrier must use this analysis at least once each year to select the route to be used in moving the HHFTs that poses the least overall safety and security risk. If the carrier’s route selection and underlying analysis are found to be deficient, the carrier may be required to revise its analysis or the FRA, in consultation with the Transportation Security Administration, may require the use of an alternate route. These procedures satisfy Safety Recommendation R-14-4, which is classified “Closed—Acceptable Action.”

R-14-6

Require shippers to sufficiently test and document the physical and chemical characteristics of hazardous materials to ensure the proper classification, packaging, and record-keeping of products offered in transportation.

We note your position (1) that the physical and chemical properties of manufactured and refined products are typically purer and therefore follow a more predictable classification pattern than other, lesser-known materials, and (2) that the Occupational Safety and Health Administration already requires documentation for hazardous chemical products under its safety data sheet requirement. We also note that you plan no further action at this time to require shippers to test and document the physical and chemical characteristics of hazardous materials beyond the scope of final rule HM-251. The final rule adopts a new section 173.41 for sampling and testing requirements for shippers transporting unrefined petroleum products. We remain concerned, however, that the failure to mandate specific and most appropriate sampling and testing methods may result in data variability that limits its usefulness for both classification and research purposes.

The recent Sandia Report¹ concluded that “due to significant variability in criteria and procedures utilized in selection, acquisition, and analysis of crude oil samples, the available data are of insufficient quality to enable a meaningful comparison of crude oils—either to each other or against a designated standard.” That report also concluded that samples are acquired from a wide range of supply chain points using a variety of open and closed sampling techniques and characterized using a variety of analysis methods.

Although newly adopted section 173.41 requires a sampling and testing program and outlines methods the shipper selects to classify the material under the Hazardous Materials Regulations (HMRs), the regulation allows shippers to subjectively select sampling and testing methods rather than using uniformly mandated standards. For example, there are eight authorized methods for determining the flash point for a flammable liquid. Five methods are available for determining the initial boiling point. We urge you to continue working with stakeholders to identify the most appropriate methods and uniform sampling and testing techniques to provide a high level of confidence that materials are being properly classified, packaged, and shipped. We also urge you to reconsider your position regarding this recommendation. Pending your reply to this request, Safety Recommendation R-14-6 is classified “Open—Unacceptable Response.”

We issued Safety Recommendation R-14-14 on August 22, 2014, as a result of a 2012 accident in which a Conrail train derailed while traveling over a moveable bridge in Paulsboro, New Jersey. Three tank cars containing vinyl chloride came to rest in Mantua Creek; one of the cars was breached and released about 20,000 gallons of vinyl chloride. Twenty-eight residents sought medical attention for possible exposure, and the train crew and many emergency responders were also exposed. Damage estimates were \$451,000 for equipment and about \$30 million for emergency response and remediation.

¹ *Literature Survey of Crude Oil Properties Relevant to Handling and Fire Safety in Transport* (Sandia National Laboratories, March 2015).

R-14-14

Require railroads transporting hazardous materials through communities to provide emergency responders and local and state emergency planning committees with current commodity flow data and assist with the development of emergency operations and response plans.

We issued this recommendation to urge you to require railroads to be more liberal with commodity flow information and to share this information with relevant emergency response organizations along *all* hazardous materials routes, not only routes or information related to the transport of HHFTs, poison inhalation hazards, explosives, or radioactive materials that are subject to consultation requirements of section 172.820. Emergency response awareness programs, such as those currently required of the pipeline industry under sections 195.440 and American Petroleum Institute recommended practice 1162 (as incorporated by reference), require, at a minimum, annual personal contact, targeted distribution of print material, or group meetings. These programs are intended to inform affected emergency officials how to recognize a pipeline incident and provide a coordinated response with the pipeline operator in a way that protects people and property.

Although a similar voluntary community outreach program exists with the Transportation Community Awareness and Emergency Response program (TRANSCAER®), no railroad regulations currently require a community-level public railroad awareness program, as pipeline regulations do for that industry. Further, recent changes to the Association of American Railroads (AAR) circular OT-55-O to revise the TRANSCAER program include a requirement that AAR members provide bona fide emergency response agencies or planning groups with specific commodity flow information covering all hazardous commodities transported through communities for a 12-month period in rank order. Thus, rail carriers that introduce hazardous materials into communities have burdened those communities with seeking out commodity flow information, in addition to maintaining trained personnel and appropriate resources, to enable them to respond to potential transportation mishaps.

Although we agree that final rule HM-251 addresses the overall intent of the safety recommendation, we are concerned that many small communities do not know how to obtain this information, nor do they have the resources to look for it or understand what to do with it if they get it. We believe that limiting rail routing disclosures to state and regional fusion centers will continue to place small communities at an emergency response preparedness disadvantage. We are aware that, on December 4, 2015, the president signed the Fixing America's Surface Transportation Act (FAST Act). Section 7302 directs the DOT secretary to issue regulations within one year that require Class I railroads to generate accurate, real-time, electronic train composition information for first responders through agreements with fusion centers and to provide information about certain flammable liquid shipments to state emergency response commissions. However, the requirement to provide fusion centers with advanced notification about shipments only pertains to HHFTs, primarily Class 3 flammable liquid crude oil and ethanol transported in unit trains by Class I railroads. The FAST Act notification requirements do not address a vast number of highly hazardous gases (flammable, nonflammable, and toxic), other flammable liquids and substances, oxidizing substances, toxic substances, and corrosive

materials. For instance, the FAST Act notification requirements do not include such materials as the Class 2.1 vinyl chloride that was being carried by Conrail (a non-Class I railroad) and released in the Paulsboro, New Jersey, accident, from which this safety recommendation was derived.

We urge you to consider that many small communities often have limited resources with which to conduct comprehensive planning for hazardous materials emergencies; accordingly, advanced notification should be required for *all* hazardous materials and *all* railroads. Pending issuance of final rules that address our concerns, Safety Recommendation R-14-14 is classified “Open—Unacceptable Response.”

We issued Safety Recommendations R-15-14 through -17 on April 6, 2015, as a result of a February 16, 2015, derailment of a CSX Transportation crude oil unit train in Mount Carbon, West Virginia, as well as a review of data collected from accidents that occurred in Gogama, Ontario, on February 14, 2015; Galena, Illinois, on March 5, 2015; and Gogama, Ontario, on March 7, 2015. All of these were issued as urgent recommendations.

R-15-14

Require that all new and existing tank cars used to transport all Class 3 flammable liquids be equipped with thermal protection systems that meet or exceed the thermal performance standards outlined in Title 49 *Code of Federal Regulations* 179.18(a) and are appropriately qualified for the tank car configuration and the commodity transported.

We are aware that, on June 12, 2015, the AAR filed an appeal of PHMSA’s final rule, stating that PHMSA should have required enhanced thermal protection systems significantly exceeding the performance standards stated in section 179.18(a) for tank cars transporting flammable liquids (100 minutes in a pool fire/60 minutes in a torch fire). The AAR pointed out that these are minimum standards originally developed for tank cars transporting flammable liquefied compressed gases. The AAR further stated that the Railway Safety Institute (RSI) tank car safety project modeled the survivability of different tank car configurations in a pool fire using the Analysis of Fire Effects on Tank Cars model, which showed that the use of thermal blankets on flammable liquid tank cars results in the tank car withstanding a pool fire for hours, or in some situations indefinitely, without product release, except through the pressure relief device. The appeal further stated that, although widespread support existed for such enhanced thermal protection standards, PHMSA had not incorporated them into the new rule.

On November 18, 2015, PHMSA published a response to appeals of its final rule HM-251.² PHMSA denied the AAR appeal regarding thermal protection systems because it did not contain a compelling basis for amending the rule. However, section 7305 of the FAST Act directs the DOT secretary to issue regulations within 1 year requiring that each tank car built to meet the DOT-117 specification and each nonjacketed tank car modified to meet the DOT-117 specification also be equipped with an insulating blanket with at least 1/2-inch-thick, DOT-approved material.

² *Federal Register*, Vol 80, No. 222 (November 18, 2015). 71952

We note that PHMSA did not apply thermal protection system requirements to all tank cars used to transport Class 3 flammable liquids as recommended by R-15-14, but instead mandated thermal protection systems to higher risk HHFT configurations because the regulatory impact analysis did not support extending this requirement to all tank cars configured in any type of train. However, section 7304 of the FAST Act requires that all tank cars used to transport any Class 3 flammable liquid shall meet the DOT-117, DOT-117P, or DOT-117R specifications in 49 CFR Part 179, regardless of train composition. The FAST Act mandates a commodity-based implementation schedule for continued use of tank cars in crude oil and ethanol service rather than a PG-based approach, as was provided in the PHMSA rule. The FAST Act requires the crude oil and ethanol fleets to be fully DOT-117 compliant by May 1, 2025. The FAST Act further requires that tank cars transporting other Class 3 flammable materials must be retrofitted or removed from service by May 1, 2025 (PG I), and by May 1, 2029 (PGs II and III).

We urge PHMSA to extend the requirement for thermal protection systems to all tank cars in Class 3 flammable liquids service, regardless of whether they are operated in an HHFT. Furthermore, we urge PHMSA to issue thermal protection regulations in accordance with the FAST Act that would require thermal blankets capable of providing protection from pool fires and torch fires that significantly exceed the current performance standard required by 49 CFR 179.18(a).

We are aware that you are drafting regulations associated with passage of the FAST Act, and we hope that our concerns, detailed above, will be addressed in these pending regulations. Pending issuance of final rules that adequately address these concerns, Safety Recommendation R-15-14 is classified “Open—Acceptable Response.”

R-15-15

In conjunction with thermal protection systems called for in safety recommendation R-15-14, require that all new and existing tank cars used to transport all Class 3 flammable liquids be equipped with appropriately sized pressure relief devices that allow the release of pressure under fire conditions to ensure thermal performance that meets or exceeds the requirements of Title 49 *Code of Federal Regulations* 179.18(a), and that minimizes the likelihood of energetic thermal ruptures.

We understand that all of the DOT-117 tank car options require the installation of a thermal protection system in combination with a reclosing pressure-relief device critical to the controlled release of internal tank pressure in the event that the tank cars are exposed to fire, and that this thermal protection system must meet the performance standard specified in 49 CFR 179.18, which prevents the release of any lading except through the pressure-relief device when subjected to a pool fire for 100 minutes and a torch fire for 30 minutes. However, the new regulations do not address their applicability to all tank cars used to transport Class 3 flammable liquids, as requested. We do note, however, that the AAR proposal, section 7305 of the FAST Act, directs the DOT secretary to issue regulations within 1 year requiring that each tank car built to meet the DOT-117 specification and each nonjacketed tank car modified to meet DOT-117 specification be equipped with an insulating blanket with at least 1/2-inch-thick, DOT-approved material.

We are aware that you are drafting regulations associated with passage of the FAST Act, and hope that our concerns, detailed above, will be addressed in these pending regulations. Accordingly, pending issuance of final rules that address these concerns, Safety Recommendation R-15-15 is classified “Open—Acceptable Response.”

R-15-16

Require an aggressive, intermediate progress milestone schedule, such as a 20 percent yearly completion metric over a 5-year implementation period, for the replacement or retrofitting of legacy DOT-111 and CPC-1232 tank cars to appropriate tank car performance standards, that includes equipping these tank cars with jackets, thermal protection, and appropriately sized pressure relief devices.

Although we would have preferred a more aggressive schedule than the 10 years for full implementation that HM-251 provides, we understand that your deadlines were based on an analysis of shop capacity and logistics and are closely aligned with those of Transport Canada.

The FAST Act further codifies a commodity-based implementation schedule that is substantially similar to that which was originally contained in HM-251, with the requirement that tank cars used for other flammable materials must be replaced or retrofitted by 2029. The NTSB continues to stress the need for a much timelier and documented replacement of the less-safe tank cars. In the absence of mandated implementation milestones, the scheduling decisions for upgrading the existing fleet of DOT-111 and CPC-1232 tank cars to safer tank car designs is left entirely to fleet owners, and may be driven by market factor influences, not safety improvements. The HM-251 rule and the FAST Act established end-stage completion dates for removing existing DOT-111 and CPC-1232 cars transporting crude oil and ethanol from service by 2025, and for removing tank cars transporting all other Class 3 commodities from service by May 1, 2029. Furthermore, the FAST Act authorizes the DOT secretary to extend the deadlines for up to 2 years if the secretary determines that insufficient shop capacity is available for retrofitting tank cars. The end result could be that many existing hazardous materials tank cars that are prone to catastrophic failure in a derailment could remain in service for up to 15 years.

The intent of the recommendation is to replace the existing, less-safe tank car fleet as quickly as possible. To date, the industry has progressed very slowly with the existing fleet retrofit and replacement work, with only 223 tank cars retrofitted to DOT-117R specifications and about 7,090 new DOT-117 tank cars entered into service.³ Accordingly, Safety Recommendation R-15-16 is classified “Open—Unacceptable Response” until PHMSA establishes a clear set of intermediate metrics that it can use to evaluate the safety improvement progress.

³ *Tank Cars Carrying Flammable Liquid in 2015* (Association of American Railroads, March 2016).

R-15-17

Establish a publicly available reporting mechanism that reports at least annually, progress on retrofitting and replacing tank cars subject to thermal protection system performance standards as recommended in safety recommendation R-15-16.

We are aware that HM-251 does not require complete transparency or full reporting for the retrofitting of all tank cars subject to the HHFT requirements; rather, the rule includes only one milestone date (January 1, 2017) by which tank car owners are required to report to the DOT the number of tank cars they own that have been retrofitted and the number that remain to be retrofitted. Further, this milestone pertains only to the retrofitting of non-jacketed DOT-111s in PG I service, and HM-251 does not specify what DOT will do with the resultant reports or if the data will be made public. We believe that this lack of transparency provides insufficient incentive for fleet owners to retrofit their tank cars early, and we are concerned that some owners may defer retrofitting to the latest possible time, thus risking shop capacity impediments to compliance.

Section 7308 of the FAST Act now requires the DOT Secretary to implement a reporting mechanism to monitor industry-wide progress toward modifying rail tank cars used to transport all Class 3 flammable liquids by the applicable deadlines established in section 7304. The data collected shall consist of the total number of tank cars modified to meet the DOT-117R specification, the total number of tank cars built to meet the DOT-117 specification, and the total numbers, types, and specifications of tank cars used to transport Class 3 flammable liquids that have not been modified. The Act requires the Secretary to report the aggregate results of the DOT tank car data survey to Congress annually.

We note that you intend to collaborate with various stakeholders to develop an additional mechanism to report the progress made in retrofitting or replacing tank car types in flammable liquids service. To this end, you are exploring with the AAR, the FRA, and Transport Canada modification of the industry's Universal Machine Logic Equipment Register system as an appropriate reporting tool. Although this action may not be completed with the urgency requested, because it could satisfy the intent of Safety Recommendation R-15-17, the recommendation is classified "Open—Acceptable Response."

We remind you that Safety Recommendations R-15-14 through -17 were issued as urgent recommendations and, as such, request that you expedite action to implement them.

Please submit updates electronically at correspondence@ntsb.gov regarding your efforts to satisfy Safety Recommendations R-14-6, and -14, R-15-14 through -17, and do not submit both an electronic and a hard copy of the same response.

Thank you for your commitment to the safe transportation of hazardous materials.

Sincerely,

cc: Ms. Barbara McCann, Director
Office of Safety, Energy, and
Environment
Office of the Under Secretary for Policy

Mr. Stephen Domotor
Chief Safety Officer
Assistant Administrator
Stephen.Domotor@dot.gov