



NATIONAL TRANSPORTATION SAFETY BOARD
Investigative Hearing

Norfolk Southern Railway general merchandise freight train 32N
derailment with subsequent hazardous material release and fires,
in East Palestine, Ohio, on February 3, 2023

GROUP	F
EXHIBIT	
34	

Agency / Organization

NTSB

Title

**NTSB Comments on PHMSA NPRM,
Hazardous Materials: Enhanced Tank Car
Standards and Operational Controls for High-
Hazard Flammable Trains 2014**



National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

September 48, 2014

US Department of Transportation
Docket Management System
Docket Operations, M-30
Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

Attention: Docket No. PHMSA–2012–0082 (HM–251)

Dear Sir or Madam:

The National Transportation Safety Board (NTSB) has reviewed the Pipeline and Hazardous Materials Safety Administration's (PHMSA) August 1, 2014, notice of proposed rulemaking (NPRM), *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains*.¹ In this notice, PHMSA, in coordination with the Federal Railroad Administration (FRA), proposes new operational requirements and improved tank car standards for certain trains transporting large volumes of hazard class 3 flammable liquids. It also proposes revising the general requirements for offerors to ensure proper classification and characterization of mined gases and liquids. PHMSA notes that the proposed requirements are designed to reduce the frequency and consequences of accidents involving certain trains transporting large volumes of flammable liquids. The risks posed by such trains are illustrated in the catastrophic consequences of recent derailments at Casselton, North Dakota; Aliceville, Alabama; and Lac-Mégantic, Quebec, Canada.

The NPRM addresses NTSB Safety Recommendations R-12-5 and R-12-6, which we issued on March 2, 2012, as a result of the June 19, 2009, derailment of an ethanol unit train of US Department of Transportation (DOT) specification 111 (DOT-111) tank cars in Cherry Valley, Illinois.² The NPRM also addresses Safety Recommendations R-14-1, R-14-3, R-14-4, and R-14-6, which we issued on January 23, 2014. These recommendations were derived from our participation in the Transportation Safety Board of Canada (TSB) investigation of the July 6, 2013, accident in Lac-Mégantic, Quebec.³

The NTSB safety recommendations urge PHMSA to take the following actions:

¹ *Federal Register* 79, no. 148 (August 1, 2014): 45016.

² National Transportation Safety Board, *Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire, Cherry Valley, Illinois, June 19, 2009*, Accident Report/RAR-12-01 (Washington DC: NTSB, 2012).

³ Transportation Safety Board of Canada, *Runaway and Main-Track Derailment, Montreal, Maine & Atlantic Railway Freight Train MMA-002, Mile 0.23, Sherbrooke Subdivision, Lac-Mégantic, Quebec, 06 July 2013* (Gatineau, Quebec, Canada: TSB, 2014).

- Require that all newly manufactured and existing general service tank cars authorized for transportation of denatured fuel ethanol and crude oil in Packing Groups I and II have enhanced tank head and shell puncture-resistance systems and top fittings protection that exceeds existing design requirements for DOT-111 tank cars. (R-12-5)
- Require that all bottom outlet valves used on newly manufactured and existing nonpressure tank cars are designed to remain closed during accidents in which the valve and operating handle are subjected to impact forces. (R-12-6)
- Work with the FRA to expand hazardous materials route planning and selection requirements for railroads under Title 49 *Code of Federal Regulations (CFR)* 172.820 to include key trains transporting flammable liquids as defined by the Association of American Railroads (AAR) Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas. (R-14-4)
- Require shippers to sufficiently test and document the physical and chemical characteristics of hazardous materials to ensure the proper classification, packaging, and recordkeeping of products offered in transportation. (R-14-6)

The NTSB recommendations also ask the FRA to take the following actions:

- Work with PHMSA to expand hazardous materials route planning and selection requirements for railroads under 49 *CFR* 172.820 to include key trains transporting flammable liquids as defined by AAR Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas. (R-14-1)
- Audit shippers and rail carriers of crude oil to ensure they are using appropriate hazardous materials shipping classifications, have developed transportation safety and security plans, and have made adequate provision for safety and security. (R-14-3)

We are pleased that you are taking a broad systems approach in this NPRM—encompassing accident prevention, mitigation, and emergency response—toward managing the safety risks posed by high-hazard flammable trains (HHFTs).⁴ PHMSA proposes to improve performance standards for existing tank cars and establish standards for new DOT specification 117 (DOT-117) and specification 117P (DOT-117P) tank cars. PHMSA also addresses classification and characterization of mined gases and liquids, requires rail routing risk assessment for HHFTs, requires notification to state emergency response commissions (SERC) of the operation of trains transporting 1 million gallons or more of Bakken crude oil in their jurisdictions, and requires reduced operating speeds and enhanced braking.

⁴ The proposed rule defines a high-hazard flammable train as a one containing 20 or more carloads of a class 3 flammable liquid. The rule primarily affects unit train shipments of ethanol and crude oil because those commodities are most often transported in high-volume shipments in trains having 20 or more cars.

The NTSB emphasizes the importance of implementing the six safety recommendations listed above as rapidly as possible. Furthermore, we are also concerned about several aspects of the proposed regulations:

1. The proposed requirements for notifying state agencies about rail shipments of hazardous materials through their territories do not include ethanol.
2. The proposed notification requirements are limited to shipments of crude oil from only one area (Bakken formation).
3. The proposed classification and characterization rules do not apply to all hazardous materials.
4. The proposed classification and characterization rules do not include specific requirements for the sampling and testing needed to properly characterize hazardous materials destined for rail shipment.
5. The proposed speed restrictions are based on a large populated area rather than on a potential impact radius where individuals could be harmed along flammable liquids rail corridors.
6. The proposed enhanced standards for new and existing tank cars offer options that do not achieve an acceptable level of safety and protection.
7. The proposed alternative tank car performance standards lack impact-resistance metrics.
8. The proposed retrofitting requirements for existing DOT-111 tank cars do not require top fittings protection.
9. The proposed bulk packaging standards would allow existing legacy DOT-111 fleet to remain in flammable liquid service on trains not designated as HHFTs.

Our comments follow the order in section V of the NPRM. We also respond to questions in section V that are germane to our safety recommendations and to other matters on which we have a basis for commenting.

High-Hazard Flammable Trains

Safety Recommendation R-14-4 urges PHMSA to include “key trains” carrying flammable liquids in its route-planning requirement. The recommendation refers to the definition of key train in AAR Circular No. OT-55-N, which lists 20 tank cars of any combination of

hazardous material as the threshold number of tank cars in the consist.⁵ In referring to the AAR circular, we intended to suggest using a preexisting industry standard for route planning, but not to endorse a 20-tank-car threshold for HHFTs. We caution you not to use Safety Recommendation R-14-4 to imply that we endorse a 20-tank-car threshold for any other purpose.

Question 3. To what extent do the covered hazardous materials, including crude oil and ethanol, have differing risks when they are in HHFTs?

As demonstrated in recent accidents, the two products have a similar potential for causing injuries, fires, energetic fireball eruptions, and property damage. Although the products behave differently in the environment and require different strategies for firefighting, containment, and cleanup, they pose similar hazards to property and persons, and should be treated similarly in the regulations. We believe that crude oil and ethanol should have identical packaging and operational requirements.

PHMSA also seeks comment on the definition of an HHFT. We believe the definition should include a broad range of hazardous materials, similar to the revised definition of a key train in AAR Circular No. OT-55-N. The circular's reference to "any combination of hazardous material" includes hazard class 2, division 2.1 (flammable gas) materials and combustible liquids, as defined at 49 *CFR* 173.115(a) and 173.120(b). The provisions of the AAR circular demonstrate that the railroad industry recognizes that additional safety precautions, including speed restrictions, are needed for key trains that transport any hazardous materials. The proposed rule should be at least as protective as the AAR circular and should therefore apply to class 2 flammable gases such as liquefied petroleum gas.

Notification to State Emergency Response Commissions

Proposed 49 *CFR* 174.310(a)(2) would apply to any railroad that transports in a single train 1 million gallons or more of petroleum crude oil, hazard class 3 (identification number UN 1267), sourced from the Bakken shale formation in the Williston Basin (centered in North Dakota but extending to South Dakota and Montana in the United States and to Saskatchewan and Manitoba in Canada). The proposed rule would require railroads to provide written notification to SERCs of the estimated number of such trains expected to travel per week through each county in each state and of the routes over which the crude oil is to be transported. The notification would also describe the crude oil, give applicable emergency response information, and list at least one railroad point of contact.

We recently completed our investigation of a November 2012 Conrail freight train derailment in Paulsboro, New Jersey, in which vinyl chloride was released.⁶ We concluded that active participation by railroads in local emergency planning would yield safer and more efficient responses to railroad accidents that result in the release of hazardous materials. In addition to notifying SERCs and local communities about the volume of hazardous materials traffic through their areas, we believe that carriers should provide communities with

⁵ Association of American Railroads, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials*, Circular No. OT-55-N (Washington, DC: AAR, 2013).

⁶ National Transportation Safety Board, *Conrail Freight Train Derailment with Vinyl Chloride Release, Paulsboro, New Jersey, November 30, 2012*, Accident Report NTSB/RAR-14-01 (Washington DC: NTSB, 2014).

comprehensive emergency planning assistance. Accordingly, we issued the following safety recommendation to the DOT:

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 development of emergency operations and response plans. (R-14-14)

Although the NPRM does not specifically address Safety Recommendation R-14-14, it proposes that railroads notify emergency responders whenever a single hazardous commodity, Bakken crude oil, is transported in quantities of more than 1 million gallons through their area. The intent of Safety Recommendation R-14-14, however, is to urge you to require railroads to provide notification and emergency planning assistance for all classes of hazardous material transported through communities, at thresholds such as the those established in the Emergency Planning and Community Right-to-Know Act for fixed facilities.⁷ We urge you to fully and expeditiously address Safety Recommendation R-14-14 in this rulemaking.

We disagree with restricting the proposed notification requirement to petroleum crude oil sourced exclusively from the Bakken shale formation. We believe that proposed 49 *CFR* 174.310(a)(2) should apply at a minimum to all class 3 flammable liquids transported in an HHFT. The properties that make crude oil flammable and hazardous are not limited to oil sourced from the Bakken formation. As one recent study concludes, “Bakken crude oil does not pose risks significantly different from other crude oils or other flammable liquids.”⁸ Bakken crude is also reported to be similar to crude oils from other geologic formations. For example, the light ends (ethane, propane, butane, pentane) of Bakken crude have been found to be comparable to those of oils produced elsewhere in North America, such as in the Eagle Ford formation in Texas.⁹

We are particularly concerned that ethanol, the other hazard class 3 commodity commonly transported in unit trains, is not included in the proposed notification requirements. While comparative accident data are limited, we believe it likely that if ethanol rather than crude oil had been transported in the train that derailed in Lac-Mégantic, a similar massive pool fire would have resulted. Notification to emergency planners and responders of the presence of tank car shipments of ethanol in their jurisdictions is critical for the same reasons you propose notification requirements for shipments of crude oil. Communities must be prepared to respond to the firefighting challenges posed by ethanol accidents—by having alcohol-resistant firefighting foam readily available, for example—and to the difficulties associated with recovering ethanol released to the environment.

Question 1. Whether codifying the requirements of the Order in the HMR is the best approach for the notification requirements, and whether particular public safety improvements

⁷ Title 42 *United States Code*, Chapter 116.

⁸ *A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation* (Prepared by Dangerous Goods Transport Consulting Inc. for American Fuel & Petrochemical Manufacturers, May 14, 2014).

⁹ *Study Report of the Bakken Crude Characterization Task Force* (Prepared by Turner, Mason & Company for North Dakota Petroleum Council, August 4, 2014).

could be achieved by requiring the notifications be made by railroads directly to emergency responders, or to emergency responders as well as SERCs or other appropriate state delegated entities.

We note in our report on the Paulsboro, New Jersey, accident that unlike fixed facilities, railroads transporting hazardous materials are not required to work with communities to develop emergency plans.¹⁰ Emergency planning responsibilities should include providing (1) emergency planning notification to both local and state emergency planning committees, (2) an emergency coordinator who participates in the local emergency planning process, (3) notice of any operational changes that could affect emergency planning, and (4) any information necessary to develop and implement local emergency plans.

The absence of a regulatory requirement for railroads to notify and assist local emergency planning committees leaves communities unprepared to deal with releases of hazardous materials. We believe that the DOT emergency restriction/prohibition order targeting railroad transportation of crude oil from a single geographic region in the United States does not go far enough, and that community notification and planning should be required for all hazardous materials transported by rail. We have found that despite voluntary outreach and community awareness programs, such as the Transportation Community Awareness and Emergency Response program, many communities and emergency responders are unaware of and unprepared for the risks associated with hazardous materials traffic on railroads. For this reason, we issued the following safety recommendation to PHMSA:

Require railroads transporting hazardous materials to develop, implement, and periodically evaluate a public education program similar to 49 *CFR* Parts 192.616 and 195.440 for the communities along railroad hazardous materials routes.
(R-14-19)

We believe that the best approach to regulating notification would be to codify the requirements detailed in Safety Recommendations R-14-14 and R-14-19.

Question 2. Whether the 1,000,000-gallon threshold is appropriate, or whether another threshold such as the 20-car HHFT threshold utilized in this NPRM's other proposals is more appropriate. If you believe that a threshold other than 1,000,000 gallons is appropriate, please provide any information on benefits or costs of the change, including for small railroads.

We are concerned that 1 million gallons is significantly above a reasonable risk threshold. At that value, notification would apply only to trains with more than about 35 tank car loads. Yet catastrophic derailment failure involving even a single tank car loaded with flammable liquid can cause extensive destruction and loss of life. Therefore, we believe that the notification threshold should be significantly lower. In addition, the threshold should be based on the worst-case consequences of a derailment resulting in fire. At a minimum, the threshold should be set no higher than the value in the proposed definition of an HHFT.

¹⁰ *Conrail Freight Train Derailment with Vinyl Chloride Release* (Washington DC: NTSB, 2014).

Question 6. Whether such information should be deemed SSI, and the reasons indicating why such a determination is appropriate, considering safety, security, and the public's interest in information.

We believe that notification information should raise the awareness of both the general public and stakeholders about hazardous materials routes running through their communities. Having an informed public along rail routes could supplement a carrier's safety measures and help reduce the consequences of emergencies involving hazardous materials. Classifying routing information about hazardous materials as "security sensitive" would unreasonably restrict the public's access to information that is important to its safety.

An informed public can be prepared to implement protective actions when accidents occur. While the general public may not require detailed information, such as the specific numbers, dates, and times of hazardous materials tank cars traveling on a route, people need to know whether they live or work near a hazardous materials route. They also need to be aware of the hazards associated with releases, what rail carriers do to prevent accidents and mitigate consequences, how to recognize and respond to an emergency, what protective action to take in the event of a hazardous materials release, and how to contact rail carriers regarding specific concerns.

Rail Routing Risk Assessment

We believe that the proposed rule, if implemented, would satisfy the intent of Safety Recommendation R-14-4, which urges PHMSA to (1) expand the hazardous materials route-planning and selection requirements for railroads under 49 *CFR* 172.820 to include key trains transporting flammable liquids, and (2) to require rerouting to avoid transporting hazardous materials through sensitive areas. You propose to expand current 49 *CFR* 172.820(a) by making it applicable to HHFTs. You also propose to create a new section, 49 *CFR* 174.310, which would subject HHFTs to the additional requirements in Part 172, Subpart I, for developing security plans for the transportation of hazardous materials.

Proposed 49 *CFR* 174.310(a)(1) would require rail carriers that operate HHFTs to analyze the safety and security risks along the routes where such trains operate, to assess alternate routing options, and to make routing decisions based on the assessments. Rail carriers would be required to conduct an annual analysis addressing 27 risk factors, such as volume of hazardous materials transported; track type, class, and maintenance schedule; track grade and curvature; environmentally sensitive or significant areas; population density along the route; emergency response capability along the route; and areas of high consequence along the route, as defined in 49 *CFR* 172.820(c). Carriers would also be required to identify alternate routes over which it has the authority to operate and to perform a safety and security risk assessment of those routes. Carriers would be required to use their risk analysis to select viable routes that pose the lowest overall safety and security risk.

Classification and Characterization of Mined Gases and Liquids

The proper classification and characterization of hazardous materials is a key requirement under the hazardous materials regulations. Classification (determination of a material's hazard

class based on certain physical properties) and characterization (determination of a material's other relevant chemical and physical properties) are of paramount importance in selecting appropriate packaging, in assessing risks when developing safety and security plans, and in assuring the safety of emergency responders and other individuals who might come in contact with hazardous materials. The importance of accurate classification is underscored by your proposed phase-out schedule for DOT-111 tank cars in HHFT service.

We are concerned that the proposed classification and characterization rule applies only to mined gases and liquids. We believe that the rules should apply to shippers of all hazardous materials, as is the intent of Safety Recommendation R-14-6. Although the current hazardous materials regulations prescribe test methods for assigning appropriate classifications, shippers are not required to maintain records showing that the physical and chemical properties of a hazardous material were sufficiently evaluated to justify the description and classification used in transporting it.

We support the proposed 49 *CFR* 173.41 sampling and testing program. The proposed regulation addresses issues that prompted us to issue Safety Recommendation R-14-6, such as offerors using generic safety data sheets that result in improper classification of crude oil, rather than validating crude oil properties through testing. We are concerned, however, that the proposed rule does not include specific requirements for characterization tests that would identify the effects of a material on both the reliability and the safety of packaging. Physical testing would improve the evaluation of a material for its impact on operational and package selection requirements under the hazardous materials regulations.

We agree with your proposal to require shippers to maintain records of sampling, testing, personnel training, and other elements of the program. Permanent records, electronic or paper-based, will provide evidence that a shipper is following the written program. Your proposal addresses the intent of the recordkeeping issue raised in Safety Recommendation R-14-6.

PHMSA also seeks comment from the regulated community on the role of vapor pressure in the classification, characterization, and packaging of flammable liquids, and on whether regulatory changes to establish vapor pressure thresholds for packaging selection are necessary. We believe that setting vapor pressure thresholds for packaging selection would clarify package limitations for shippers and encourage them to select the safest tank car for transporting flammable materials. We understand that the purpose of a vapor pressure threshold would be to define the point at which volatile flammable materials would require transport in pressure tank cars. We suggest that you review the TSB laboratory report on the analysis of crude oil samples, which suggests that the size of a fireball resulting from the ignition of spilled crude oil strongly depends on vapor pressure.¹¹

Question 3. Would more or less specificity regarding the components of a sampling and testing program aid offerors (sic) of shipments to be in compliance with proposed § 173.41?

¹¹ Transportation Safety Board of Canada, Laboratory Report LP 148/2013, "Analysis of Crude Oil Samples" (Appendix K of *Runaway and Main-Track Derailment, Montreal, Maine & Atlantic Railway Freight Train MMA-002*), available online at www.tsb.gc.ca.

We believe the rule should specify minimum required properties of mined gas and liquids to be included in sampling and testing plans and that it should list acceptable test methods. Without uniform testing and sampling requirements, shippers are free to develop individual testing regimes, which can yield subjective characterizations of hazardous materials. Moreover, non-uniform testing will not support data analysis or enforcement.

Question 4. Do the guidelines provides (sic) sufficient clarity to offerors to understand whether they are in compliance with these requirements?

As noted in the NPRM, the American Petroleum Institute is developing Recommended Practice 3000 to spell out industry best practices for testing and sampling methods. We urge you to consider adopting an appropriate recommended practice or to provide specific guidance in the rule mandating uniform sampling and testing methods.

Additional Requirements for High-Hazard Flammable Trains

Speed Restriction

We agree that HHFT speed restrictions are vital to reducing risks in the transportation of hazardous materials. Tank car crashworthiness is inversely related to train speed—that is, crashworthiness generally increases as speed decreases. Nevertheless, catastrophic tank car ruptures can occur at speeds below even 10 mph.¹² We have not conducted or commissioned tests or research to examine the effects of different speeds. Therefore, we cannot comment about the specific values proposed in the NPRM. We nevertheless believe that lower operating speeds would yield safety benefits, especially if lower speeds were combined with distributed power units, two-way end-of-train devices, or electronically controlled pneumatic brakes. Because lower operating speeds reduce the kinetic energy in a train consist, they could, if coupled with improved stopping ability, minimize the dynamic behavior and number of tank cars involved in an accident.

We interpret the proposed HHFT speed restrictions as follows: For tank cars that have enhanced brake systems and all DOT-117 tank cars, the speed limit would be 50 mph. For tank cars with enhanced brake systems and some flammable liquids in non-DOT-117 cars, three options for speed restrictions are proposed: (1) 40 mph in all areas, (2) 40 mph in areas with populations of 100,000 or more, or (3) 40 mph in high-threat urban areas. For tank cars without enhanced brakes, the speed limit would be 30 mph.

We disagree with your plan to set speed limits based on general population size. Instead, speed limits should be based on the population that is close enough to a derailment involving a flammable material to be in harm's way. An exposure to a rail transportation hazard is inversely proportional to the distance away from the track. When comparing small and large population densities, the large population areas and high threat urban areas (HTUA) have greater security vulnerabilities, which you have offered as a basis for the proposed Option 3 speed restriction. However, accidental safety-related events have a much greater probability of occurrence than an intentional (criminal) action. Furthermore, we believe there is no credible train derailment

¹² See *Conrail Freight Train Derailment with Vinyl Chloride Release* (NTSB, 2014).

scenario involving a flammable liquid event, accidental or intentional, involving even a unit train that could jeopardize a population of 100,000 or more or the population within an HTUA.

The proposed regulation for speed restrictions should be based on scenarios that might actually harm individuals, as is the approach used in the PHMSA gas pipeline regulations. Those regulations establish threat zones in which a potential impact radius (PIR) is calculated based on pipe size and operating conditions. The number of occupied buildings in a PIR is counted along the entire length of a pipeline. If the number of buildings exceeds the threshold PIR value, the pipeline is designated to be in a high-consequence area. The pipeline operator must then implement an integrity management program for that pipeline segment. We suggest that you could develop similar “impact radius” and “occupied building” criteria based on the specific fire and explosion hazards associated with an HHFT along a designated rail corridor. You could then assign speed restrictions to reduce the risk in that corridor.

Question 7. What other geographic delineations—in addition to HTUAs and cities with 100,000 people or more—should PHMSA consider as an Option for a 40-mph speed restriction in the absence of a proposed DOT-117 tank car?

We urge you to consider HHFT speed restrictions that specifically address reducing the risk of a major flammable liquid release into a navigable waterway or environmentally sensitive area. For example, an April 30, 2014, derailment of a crude oil unit train in Lynchburg, Virginia, released nearly 30,000 gallons of crude oil from one tank car into the James River, causing significant environmental damage.

Alternative Brake Signal Propagation Systems

The NPRM discusses improved stopping performance using braking systems that could reduce the likelihood of a tank car being punctured during a derailment. We agree with the proposal to require that all HHFTs be equipped with alternative brake signal propagation systems (either distributed power units, two-way end-of-train devices, or electronically controlled pneumatic brakes). We further suggest that you prohibit the use of conventional locomotives for HHFT service.

Enhanced Standards for New and Existing Tank Cars

New DOT Specification 117 Tank Car

PHMSA proposes new standards for tank cars used in HHFTs as Part 179, Subpart D. The new DOT-117 cars would offer improved crashworthiness over the current DOT-111 tank cars. The new standards address tank car head and shell puncture resistance, top fittings protection, and bottom outlet performance, which are addressed in Safety Recommendations R-12-5 and R-12-6; the new standards also address thermal protection systems.

On April 22–23, 2014, we held a forum titled “Rail Safety: Transportation of Crude Oil and Ethanol.” Testimony at the forum suggested that regulators, railroad industry, tank car builders, and tank car owners disagree about the level of protection needed for tank cars that transport flammable materials. The lack of consensus continues as you are proposing three design options for tank cars built after October 1, 2015, for use in transporting class 3 flammable

liquids in HHFTs. The safety features for tank cars constructed under each option, as listed in Table 2 (“Safety Features by Tank Car Option”) of the NPRM, can be summarized as follows:

- Option 1, the PHMSA- and FRA-designed tank car, would have full-height, 1/2-inch-thick head shields; a shell at least 9/16-inch thick constructed of TC-128 Grade B normalized steel; an 11-gauge jacket with thermal protection system; a reclosing pressure-relief device; a top fittings protection system capable of sustaining rollover at 9 mph without failure; a removable handle on the bottom outlet (if present) or one designed to prevent unintended actuation in an accident; and electronically controlled pneumatic brakes.
- Option 2, the AAR-recommended tank car, would have the same features as in option 1, except that top fittings would be equipped in accordance with AAR specifications for tank cars, and braking would be improved with distributed power or end-of-train devices.
- Option 3, the enhanced CPC-1232 tank car, would have the same features as in option 2 except for a thinner (7/16-inch) tank shell.

Safety Recommendations R-12-5 and R-12-6, regarding enhanced tank car specifications and retrofitting for ethanol and crude oil, are linked only to Packing Groups I and II. We believe, however, that you make a compelling argument for why enhanced packaging requirements should be required for HHFTs that transport materials in Packing Group III as well. We agree with you that large volumes of flammable material in any packing group transported in an HHFT pose significant safety and environmental risks in accidents (as summarized in Table 22 of the NPRM, “Enhanced Car Standards for Flammable Liquids in HHFT”). We also agree that requiring Packing Group III materials to be transported in a more robust tank car than currently used would reduce the potential for environmental damage by decreasing the probability of hazardous material releases.

Testimony at the NTSB rail safety forum by advocates representing tank car owners suggests their continued support for construction to the CPC-1232 base standard, which unlike option 3, does not require a jacket, thermal protection, or full-height head shields. Table 17 of the NPRM (“Effectiveness of Newly Constructed Tank Car Options Relative to the Non-Jacketed DOT 111 Specification Tank Car”) indicates that, based on modeling, the CPC-1232 standard would provide less puncture resistance than any of these options. The table also indicates that option 3 would offer significantly less puncture resistance than options 1 and 2. The discussion in the NPRM of option 3 states, “This standard is the configuration PHMSA believes will be built for HHFT service in the absence of regulation” We are concerned that to the contrary, without a regulation, new tank cars will continue to be built to the less-protective CPC-1232 standard (non-jacketed, half-head shield) and that the railroad industry will not act to phase out or retrofit the existing DOT-111 fleet.

We understand that as proposed, tank cars built to any one of the three options would be designated as DOT-117 cars. We are concerned that if so, carriers are likely to select option 3, which is the least costly (see NPRM Table 5, “20 Year Costs and Benefits by Stand-Alone Proposed Regulatory Amendments 2015-2034”), even though that option offers the least

improvement in safety. We therefore urge you to reexamine your plan to include all three options and instead, include only the option that achieves the highest level of safety and protection.

You also propose an alternative performance-based design requirement for each tank design option. This “performance standard” is intended to encourage innovation and new materials that would provide puncture resistance and thermal protection equivalent to the DOT-117 options. Tank cars built to the performance standard would be classified as DOT-117P.

We are concerned that the proposed performance standards do not give sufficient guidance for puncture-resistance tests. The proposed regulations at 49 *CFR* 179.202-11(c), 179.203-11(c), and 179.204-11(c) give only minimum side impact speeds for head and shell puncture tests using a 12-inch-by-12-inch impactor, with no further discussion about test conditions or about how to interpret results. On July 18, 2014, Transport Canada proposed to amend Canada’s Transportation of Dangerous Goods regulations to require a new Class TC-140 tank car for rail transport of flammable materials. In contrast to your proposed regulations, Transport Canada proposes puncture resistance performance criteria that specify such details as geometry of the impacting punch, tank car outage and lading specific gravity, constraint on the tank, required alignment of the impactor with the tank, and when the impact test would be considered successful. We believe that your proposed rule should include similar requirements.

Existing Tank Cars for High-Hazard Flammable Trains

The NPRM addresses Safety Recommendations R-12-5 and R-12-6 with respect to the current DOT-111 fleet used in HHFT service. You propose to require that existing tank cars be retrofitted to meet performance standards for the applicable tank car specification option in Part 179, Subpart D. Retrofitted tank cars would meet the DOT-117P performance standard, except that they would not be required to add the top fittings protection.

The reason retrofitting for top fittings protection would not be required in the proposed rule is that you believe the cost of such a retrofit is not supported by a corresponding safety benefit. You claim that “the volume of releases from top fittings is a fraction, typically less than 5 percent of the volume of releases from tank shell and head punctures.” Contrary to your claim, we call attention to data from two recent accidents showing that large volumes of flammable liquids were released through breaches in damaged top fittings alone (see table 1).

Table 1. Releases of Flammable Liquids from Tank Cars Breached Only Through Top Fittings in Two Recent Accidents

Accident Site	Accident Date	Car Number	Lading (gal)	Amount Released (gal)	Percent of Contents Released
Cherry Valley, IL	June 2009	CITX 224236	28,757	26,357	92
Cherry Valley, IL	June 2009	CTCX 731599	28,800	20,700	72
Cherry Valley, IL	June 2009	NATX 303067	28,776	11,051	38
Tiskilwa, IL	October 2011	UTLX 208371	28,905	10,706	37

The Lac-Mégantic accident also clearly demonstrates the benefits of top fittings protection. The TSB accident investigation found that unprotected top fittings were breached in 16 out of 31 DOT-111 tank cars, while breaches occurred in only 4 of 32 tank cars equipped with top fittings protection.¹³ In its accident report (p. 110), the TSB states:

Without adequate top-fitting protection during a rollover, and without design improvements to bottom outlet valves, there is an increased risk of product release when general-service Class 111 [DOT-111] cars are involved in derailments. If Class 111 tank cars that do not meet enhanced protection standards transport flammable liquids, there is an ongoing risk of product loss and significant damage to persons, property, and the environment when these cars are involved in accidents.

We strongly urge you to reconsider a retrofit requirement for top fittings protection on DOT-111 tank cars in continued crude oil and ethanol service, as requested by Safety Recommendation R-12-5. Safety Recommendation R-12-5 cannot be closed in an “acceptable” status unless existing tank cars are retrofitted with top fittings protection.

Bulk Packaging Requirements

We note that the proposed bulk packaging requirements in 49 *CFR* 173.241, 173.242, and 173.243 provide phase-out periods in which DOT-111 tank cars would no longer be authorized for HHFTs. Continued use of DOT-111 tank cars in crude oil and ethanol service is not, however, explicitly prohibited in the proposed new regulation for trains containing 19 or fewer crude oil or ethanol tank cars. It is important to note that 19 tank cars can carry more than 500,000 gallons of flammable liquid. The proposed rule would therefore allow shippers to use tank cars that are less protective than the current (voluntary) industry standard. We urge you to correct the language in proposed *CFR* 49 173.241 through 243 by replacing “high-hazard flammable train service” with “flammable liquid service” in each paragraph.

For Packing Group I, DOT-117 tank cars would be required after October 1, 2017; for Packing Group II, after October 1, 2018; and for Packing Group III, after October 1, 2020. You note that you based those dates on manufacturers’ capacity to build new tank cars, on fleet statistics, and on projected tank car originations. Considering the speed with which the crude oil

¹³ Transportation Safety Board of Canada, Laboratory Report LP 149/2013.

and ethanol industry has grown in recent years, we believe the industry can achieve the proposed dates. Each delay in implementing a new design requirement allows the construction of more insufficiently protected tank cars that will both increase the immediate risks to communities and require costly modification later. We therefore urge swift adoption in the final rule with aggressive completion dates.

Conclusion

The NTSB strongly believes in a three-tiered approach to rail safety involving industry, emergency planning and response organizations, and the public. Railroads must pursue aggressive mitigation strategies, adopt operating restrictions, apply better braking technology, conduct risk analyses to select the safest routes, and ensure that track inspection is of the highest quality and proper frequency. Railroads, communities, and emergency responders must develop comprehensive response plans, ensure their preparedness for responding to worst-case releases in accidents, and expand public awareness. Shippers must use the most robust tank cars available to lessen the consequences of accidents involving hazardous materials.

We urge you to promptly move these critical safety initiatives forward and to issue a final rule incorporating the proposed regulations without delay. We believe that the balanced actions offered by the NPRM, with the improvements suggested in this letter, would improve safety in transporting large volumes of flammable liquids by railroad as well as avoid overreliance on any single risk-reduction strategy.

Transport Canada has proposed to amend Canada's Transportation of Dangerous Goods regulations by requiring a new Class TC-140 tank car for rail transport of flammable materials such as petroleum crude oil and ethanol. The features of the proposed TC-140 car align closely with those of your proposed DOT-117 car under option 1.

We applaud the close cooperation between the United States and Canada in proposing more robust regulations for rail tank cars that carry hazardous materials. The two countries share not only an integrated market but also the increased risks to their lands, structures, and populations posed by the expanded transport of dangerous goods by rail. It is thus crucial for the federal regulations of both countries to be harmonized to the greatest extent possible.

We appreciate the opportunity to comment on the notice.

Sincerely,