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AMERICAN PETROLEUM INSTITUTE

ASSOCIATION OF AMERICAN RAILROADS

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

Re: Hazardous Materials: Rail Petitions and Recommendations to Improve the Safety of Railroad Tank Car Transportation (RRR)

The Association of American Railroads (AAR) on behalf of itself and its member companies and the American Petroleum Institute (API) on behalf of itself and its member companies offer the following comments in response to the Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration's (PHMSA) request for comments on Docket PHMSA-2012-0082.

AAR's member railroads account for most of the rail transportation of flammable liquids and have a substantial interest in the proposed tank car standards and operating requirements. API represents more than 600 companies involved in all aspects of the oil and natural gas industry including the exploration, production, shipping, transportation and refining of crude oil and has a substantial interest in the proposed rules governing crude by rail.

Our country is in the midst of an energy renaissance that has allowed us to become a global leader in energy production. AAR and API support a rule that enhances the safety of rail transportation in North America while allowing for the continued growth of our oil and natural gas production. The geographic diversity of the railroads, coupled with emerging non-traditional production regions, has led to a mutually beneficial partnership between the oil and rail industries as new resources are produced and transported.

In June, 2014, the combined oil and rail executive leadership agreed to work collaboratively to identify and implement proven practices to prevent, mitigate and respond to risks associated with moving crude oil by rail. As part of that effort, the members of AAR and API have jointly developed a response to PHMSA's proposed rail tank car standards and are providing PHMSA with comments and suggestions directed towards improving PHMSA's recommended tank car design, tank car retrofit design, and implementation schedule.

The oil and rail industries' commitment to safety, efficiency and environmentally responsible operations is reflected in the joint comments. We encourage PHMSA to consider the issues raised in our comments and take a measured, data-based approach as they finalize the rulemaking.

Sincerely,

President and Chief Executive Officer
American Petroleum Institute

President and Chief Executive Officer
Association of American Railroads

Attachment

September 30, 2014

BEFORE THE
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

DOCKET NO. PHMSA—2012—0082 (HM-251):
HAZARDOUS MATERIALS: ENHANCED TANK CAR STANDARDS AND OPERATIONAL CONTROLS FOR HIGH-HAZARD FLAMMABLE TRAINS

COMMENTS OF THE
ASSOCIATION OF AMERICAN RAILROADS AND
AMERICAN PETROLEUM INSTITUTE

The Association of American Railroads (AAR),[1] on behalf of itself and its member railroads, and the American Petroleum Institute (API),[2] on behalf of itself and its member petroleum companies, jointly submit the following comments in response to the notice of proposed rulemaking (NPRM) on requirements for the transportation of flammable liquids by rail.[3] AAR's member railroads account for most of the rail transportation of flammable liquids and have a substantial interest in the proposed tank car standards and operating requirements. API's members are involved in all segments of the transportation of crude oil and refined product in transportation and own and or lease a substantial number of tank cars.

I. Introduction

These comments address tank car specifications. AAR and API are separately filing comments addressing other issues raised by the NPRM, as well as raising additional points in support of these proposed tank car specifications.

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[1] AAR is a trade association whose membership includes freight railroads that operate 83 percent of the line-haul mileage, employ 95 percent of the workers, and account for 97 percent of the freight revenues of all railroads in the United States; and passenger railroads that operate intercity passenger trains and provide commuter rail service.

[2] API represents more than 600 companies involved in all aspects of the oil and natural gas industry including the exploration, production, shipping, transportation and refining of crude oil.

[3] *See* 79 Fed. Reg. 45,016 (August 1, 2014). AAR is filing separate comments on the issue of providing crude oil routing information to State Emergency Response Commissions.

On April 9 and July 15, 2014, Secretary of Transportation Anthony Foxx wrote AAR the enclosed letters, asking that the AAR Tank Car Committee, which has representatives from the railroads, shippers, tank car lessors, and tank car manufacturers, reach consensus on a revised tank car design and a retrofit program for the purposes of this rulemaking proceeding. In an effort to fulfill the Secretary's request, AAR and API discussed the tank car issues with various parties, taking into account all the factors that must be considered in setting tank car specifications.

AAR and API are pleased to report that they were able to reach agreement on proposed tank car specifications and a retrofit schedule for crude oil shipments. The agreement calls for significant improvements to a number of safety-critical features of tank cars.

Specifically, AAR and API suggest the following improvements:

• New tank cars would have a 1/2" shell with a jacket, thermal blanket, full-height head shields, an appropriately-sized pressure relief device, bottom-outlet handle protection, and top fittings protection.

• Legacy DOT-111 non-jacketed (not built to the CPC-1232 standards) tank cars would be retrofitted with jackets, thermal blankets, full-height head shields, appropriately-sized pressure relief devices, bottom-outlet handle protection, and valve protection.

• CPC-1232 non-jacketed cars would be retrofitted with jackets, thermal blankets, full-height head shields, appropriately-sized pressure relief devices, and bottom-outlet handle protection.

• Existing jacketed cars would be retrofitted with an appropriately-sized pressure relief device and bottom-outlet handle protection.

• Any cars that are retrofitted to these standards should be allowed to be used for their full life.

• The retrofit schedule for crude oil only would contain a retrofit deadline for legacy, non-jacketed DOT-111 tank cars three years after a ramp-up period for tank car facilities, with legacy, non-jacketed CPC-1232 tank cars subject to a retrofit deadline six years after the ramp-up period, following the DOT-111 non-jacketed fleet.[4]

• The fleet retrofits could place a priority on crude oil and ethanol since they account for most of the unit train service for flammable liquids.

Following is an explanation of these proposals.

II. Tank Car Specifications

API and AAR achieved the goal of identifying a tank car design for crude oil based on a rigorous analysis of all the available information. This was accomplished through multiple teleconferences and face-to-face meetings where a multitude of factors were reviewed prior to determining the proposed tank car designs and a schedule to implement those designs.

Three critical factors were reviewed and assessed: 1) puncture and spill resistance; 2) avoidance of a thermal rupture of the tank car and 3) crude oil characteristics. Industry's measure of the conditional probability of release (CPR) addresses the chance that there will be a release due to a puncture or a tear should there be an accident. CPR is based upon the Railway Supply Institute (RSI) – AAR Tank Car Safety Research and Test Project (the "Project") database, which contains damage and release information for more than 40,000 tank cars involved in derailments over the last 40+ years. This database allows users to ascertain the effect on CPR of specific tank car features. The features directly relevant to CPR include shell thickness, jackets, head shields, and top and bottom fittings protection. The CPR database allowed API and AAR to assess the improvements for a number of tank car retrofit and design scenarios.

AAR and API reviewed the results of the Analysis of Fire Effects on Tank Cars (AFFTAC) model instead of CPR to analyze the potential for a heat-induced rupture. Industry's tank car database does not contain enough information to address the ability of a tank car to withstand a thermal rupture. The two features most relevant to considering the probability of a heat-induced rupture occurring are the type of thermal protection and pressure relief valves. However, the AFFTAC model was not optimized for a complex multiple component substance such as crude oil. The API Crude Oil Physical Properties Ad-hoc Group (COPP) adapted the model with specific crude oil surrogates to ensure that the best application of

[4] The retrofit schedule was based on crude oil only. AAR and API did not intend this time frame to govern all flammable liquids.

the model was employed to better predict the behavior of crude oil under pool fire conditions.

AAR and API were jointly briefed on the work of the COPP, which is still studying alternative methods for the classification of crude oil with regard to shipping classification. The COPP membership was expanded when the railroads later joined the group, and continues to include experts from the petroleum industry, regulators and other industry experts. The work of the COPP is ongoing and is focused on whether there is additional information that should be used to characterize crude oil for classification for transportation, and if there is new crude oil information that should be communicated as subsidiary risks.

Following review and discussion of the database, model and industry work i.e., CPR, AFFTAC, and the COPP analyses, AAR and API agreed that when taken together they provide the best information available for determining the best tank car design.

A. Improved Puncture and Spill Resistance – Results from the CPR database

Shell thickness requirements need to be viewed from the perspective that what is feasible for new cars is not necessarily what is feasible for existing cars. The shell on existing cars, of course, cannot be made thicker. Furthermore, it is not only shells that provide protection against punctures – jackets and head shields play a valuable role as well. The thicker the shell/jacket combination, the more an object has to penetrate to create a puncture.

Modifying the existing tank cars (non-jacketed legacy DOT-111 and CPC-1232 tank cars) by adding full-height head shields (FHHS) and jackets results in significant improvement in the CPR. The FHHS provides protection from impacts to the end of the train from couplers and other structures. While 70 percent of the impacts occur on the lower half of the head shield, adding a FHHS will improve performance to the rest of the head. Adding a jacket provides a crumple zone and can further deflect a glancing blow delivered during a derailment that would otherwise be seen directly at the tank shell. Combined, the retrofitted DOT-111 and CPC-1232 tank cars would result in a tank car fleet with a very low CPR.

The CPR for the newly proposed 1/2" car with a jacket would be 3.7 percent. The other tank cars would be equivalent to the PHMSA Option 3 tank car or a CPC-1232 7/16" car, with a CPR of only 4.57 percent. While Transport Canada has proposed allowing the existing CPC-1232 cars (both 1/2" without jackets and 7/16" with jackets) to be allowed to be used for their useful life, we believe that the optimized approach is to retrofit the 1/2" CPC-1232 non-jacketed cars as well as build the new cars with a 1/2" shell. The 1/2" shell results in a CPR>100 of 3.7 percent, compared to a CPR>100 for a 7/16" shell of 4.6 percent.

The puncture and impact improvements that result from jacketing the fleet do not indicate a need to make all tank cars meet the new tank car specification, as suggested in PHMSA's proposed rule.

In addition to assessing the overall protection against releases afforded by shell thickness and jackets, tank car specifications need to take into account the need to transport commodities. It is axiomatic that the thicker the shell (or the shell and jacket combined), the lower the CPR. However, at some point extra thickness provides diminishing safety benefits while making rail transportation inefficient and uneconomical by requiring more tank cars to move product. That is hardly in the national interest. For example, the transportation of crude by rail is a critical component of the nation's effort to achieve energy independence. Indeed, in the NPRM PHMSA acknowledges the role railroads play in the transportation of crude oil and ethanol.[5] The AAR and API tank car design supports this work.

B. New Car Specification

1. Shell Thickness

For the new cars, the API/AAR Group reviewed the science of tank car thickness and the weight benefits of a lighter car and determined that the optimized design is a tank car with shells 1/2" thick, a FHHS, a thermal blanket, jackets, top-fittings protection, a pressure relief device, and bottom-outlet handle protection. As demonstrated in the CPR model and as shown in Figures 1, 2, and 3, the proposed new tank car design shell thickness of 1/2" is stronger than the PHMSA proposed 7/16" option.

Table 1 below shows the CPRs for the jacketed and non-jacketed legacy DOT-111 and CPC-1232 cars, and a tank car identical to the jacketed CPC-1232 car but with a 1/2" shell. The CPR for releases of more than 100 gallons is shown as well as the overall CPR since minor leaks are not the concern addressed by the NPRM. Figure 1 presents the CPR greater than 100 in graphical form.

[5] *See* 79 Fed. Reg. 45,017.

Table 1.
Conditional Probability of Release for Tank Car Configurations[6]

Car Category	Tank Car Features	CPR (%)	CPR >100 gal. (%)
Legacy DOT 111	7/16" shell	26.6	19.6
	7/16" shell, JKT	12.8	8.5
CPC-1232 DOT 111 without JKT	½" shell, HHS, TFP	13.2	10.3
CPC-1232 DOT 111 with JKT	7/16" shell, JKT, FHHS, TFP	6.4	4.6
CPC-1232 DOT 111 with ½" Shell & Jacket	½" shell, JKT, FHHS, TFP	5.2	3.7

JKT – jacketed; HHS – half-height head shield; FHHS – full-height head shield; TFP – top-fittings protection

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[6] The CPRs in this table are significantly lower than the CPRs published in the RSI-AAR Project's Report RA-05-02, "Safety Performance of Tank Cars in Accidents: Probabilities of Lading Loss," (January 2006). For example, the recalculated CPR for the current DOT-111 tank car without a jacket is 25 percent lower than was calculated in 2006. There are three reasons. One, RA-05-02 used data from accidents that occurred from 1965-1997. The CPRs in Table 1 are based on more recent data, from 1980-2010. More recent data are more likely to be representative of accidents occurring today. Two, Table 1 CPRs were calculated utilizing more factors than were used in RA-05-02, including train speed, derailment severity, tank diameter, and commodity transported. Three, the techniques used for the newer analysis allowed for better handling of some of the complexities of the data that could have masked important relationships in the RA-05-02 analysis.

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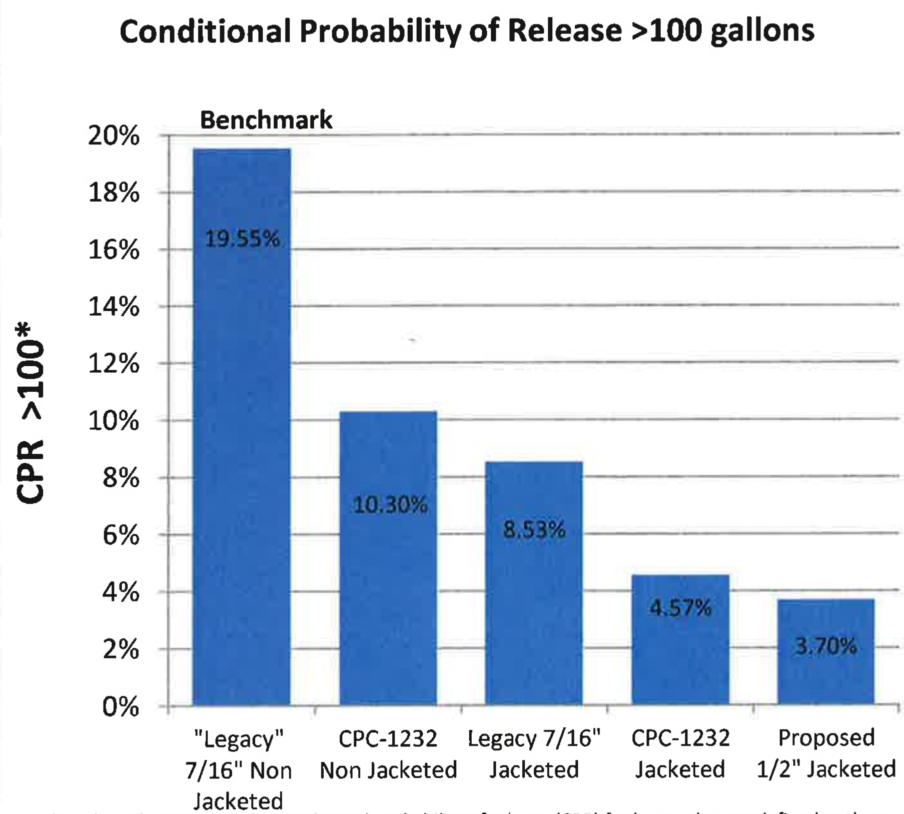
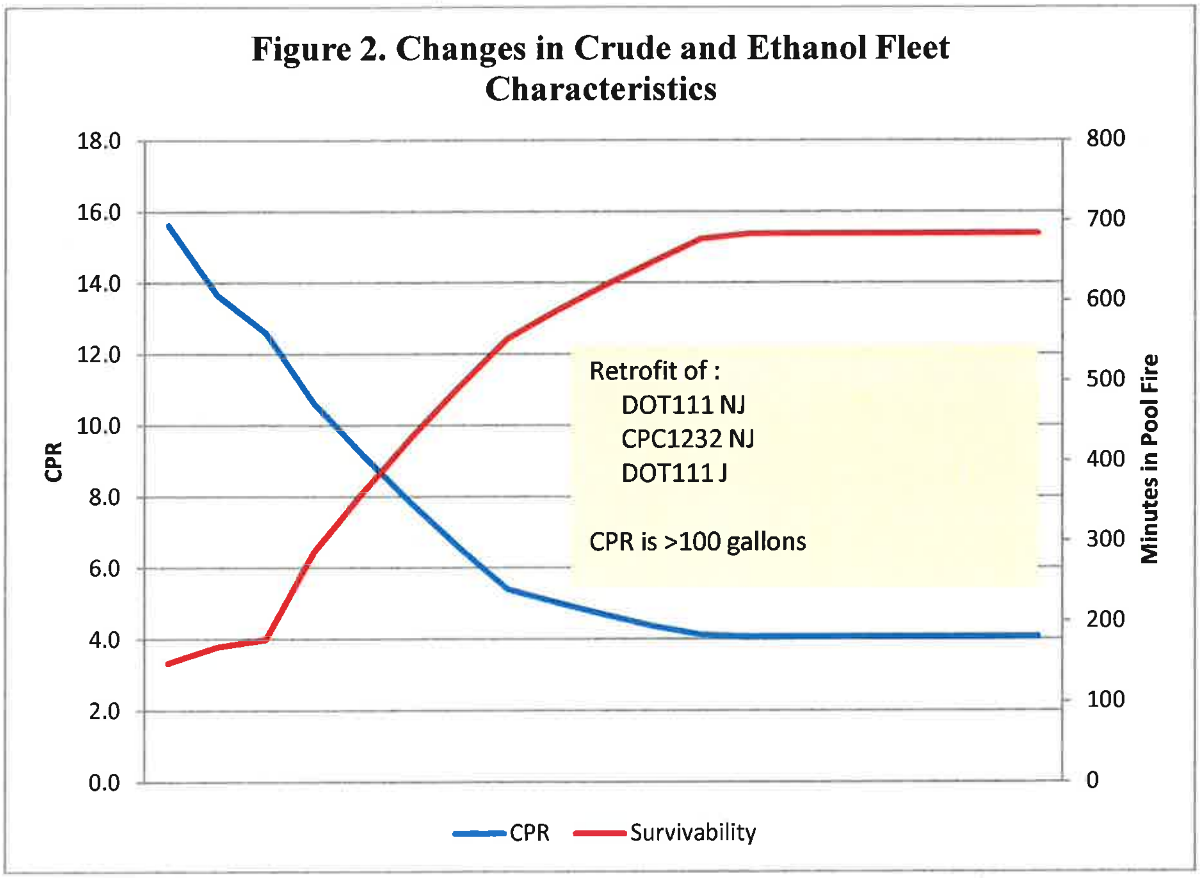
Figure 1. Conditional Probability of Release for Different Car Types



*CPR(>100) represents the conditional probability of release (CPR) for large releases, defined as those greater than 100 gallons

Note: The conditional probability of release for each tank car was calculated by the RSI-AAR Railroad Tank Car Safety Research and Test Project, a cooperative program by the Railway Supply Institute (RSI)

There is considerable discussion in the NPRM of the risk posed by unit trains of flammable liquids. Because most unit trains of flammable liquids are unit trains containing crude oil or ethanol, and assuming the final rule addresses all flammable liquids, AAR and API could support establishing a deadline for tank cars transporting crude oil and ethanol earlier than the deadline for other flammable liquids. Focusing on improving tank cars transporting crude oil and ethanol would result in a significant improvement in overall transportation safety. This is reflected in Figure 2 which shows the overall improvement in the **fleet** CPR going from an average of 15.6 percent to about 4.1 percent. Figure 2 also shows the substantial gains in how the tank cars will perform in a pool fire moving from over 100 minutes on average to nearly 700 minutes on average.

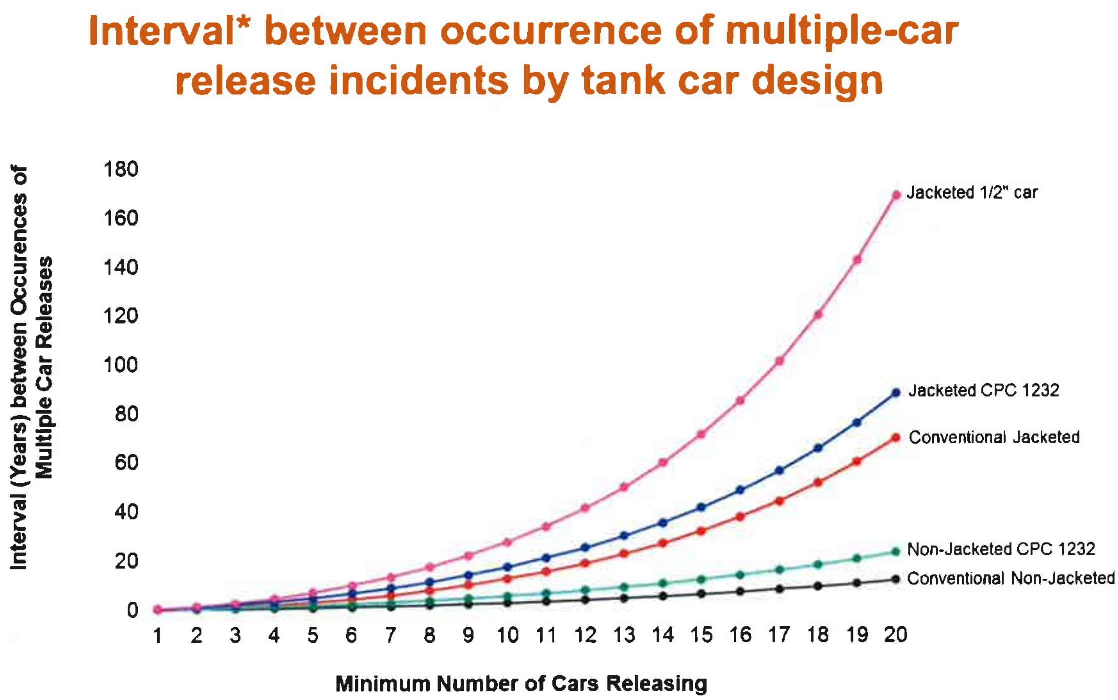


In addition to looking at CPR for individual cars, the University of Illinois has been examining the possibility of assessing the probability of multiple car releases in an accident. Based on preliminary work, the University of Illinois has posited the frequency with which releases from multiple cars could be expected in an accident from a unit train transporting flammable liquids, assuming all cars in a train were of the same type.[7] Figure 3 below shows that the tank car specification could significantly affect the interval between accidents with multiple car releases. For example, Figure 1 posits that a 20-car release could be expected approximately every 12 years with a legacy non-jacketed DOT-111 car, while the estimated interval is almost 13 times greater (169 years) with a jacketed ½" car. The interval for the jacketed CPC-1232 car is also significantly lower than for the legacy non-jacketed DOT-111 car, approximately 88 years, 7 times lower than the interval for a legacy non-jacketed DOT-111 car. Significantly, the preliminary analysis is based on historical operating practices and accident rates and does not account for

[7] For the purposes of the preliminary analysis, the University of Illinois assumed trains transport flammable liquids in unit trains with five locomotives and 80 tank cars.

measures taken (other than tank car improvements) to reduce the probability of a release occurring.

Figure 3. Interval Between Multiple-Car Releases From Flammable Liquid Unit Trains (Preliminary findings)



* Assuming no change in 2012 levels of crude oil and alcohol tank car traffic (ca. 550,000 carloads)
Ceteris paribus, the estimated intervals will be reduced in proportion to increases in traffic

2. Top-Fittings Protection.

The NPRM discusses two types of top-fittings protection, a performance standard requiring that the protection be required to withstand a rollover accident at a speed of 9 mph and AAR's design standard set forth in Appendix E, paragraph 10.2.1, of AAR's Specifications for Tank Cars. Heretofore, the performance standard has only been required for cars transporting toxic-by-inhalation hazardous materials.

AAR and API oppose requiring the performance standard for top-fittings protection. First, there would be a logical inconsistency in requiring that the performance standard be met for flammable liquids, but not other hazardous materials transported in pressure tank cars, e.g., flammable gases. If DOT wanted to consider requiring the performance standard for hazardous materials other than

TIH commodities, it should institute a separate rulemaking proceeding addressing other categories of hazardous materials, not just flammable liquids.

Second, the performance standard cannot be justified on a cost-benefit basis. The benefit is marginal. In fact, the RIA's analysis of the benefits of the performance standard is flawed.

PHMSA exaggerates the benefits of top fittings protective systems by assuming the systems will result in a significant reduction in the quantity lost in the event of a release, as well as assuming systems will reduce the likelihood of a release at all. While the protective system should reduce releases, the quantity released is unlikely to be affected to any significant degree by top fittings protection once there is a breach. There may be some reduction in quantity lost if in certain cases the damage is minimal enough that there is a very small opening for the release, but there is no basis for assuming that release quantities would be halved, as PHMSA assumes.[8]

Furthermore, AAR and API question FRA's conclusions about the relative effectiveness of the performance standard. PHMSA observes that the performance standard is based on dynamic loads; standard top fittings protection is based on static loads. PHMSA then states that

> stresses imparted in the tank shell during the dynamic loads are three times those encountered during the static load. Therefore, DOT assumes the effectiveness of top fittings for the Option 1 tank car is three times that of the other tank car options.[9]

PHMSA's conclusion about the relative effectiveness of the proposed 9 mph standard is likely incorrect and overstates the relative effectiveness of the 9 mph standard. Unfortunately, there is not enough information in the docket to definitively evaluate PHMSA's modeling. To begin, it is unclear what is meant by "stresses imparted into the shell;" does this mean into the nozzle, and if so, how? Also, assuming that peak stress correlates well with effectiveness is incorrect. This assumption might arise from comparing the Sharma rollover tests to the rollover protection survival requirement, which would be inappropriate because the Sharma tests tipped the car and the motion was stopped by the fittings striking the ground, which differs from the regulatory assumption of a car beginning on the ground and continuously rolling.

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[8] *See* "Calculating Effectiveness Rates of Tank Car Options," p. 11.
[9] Regulatory Impact Analysis, p. 118.

On the other hand, the performance standard would involve significant costs. According to information presented by RSI to PHMSA the cost of adding Top Fittings Protection can be more than $24,000 and could add significantly to the time that is required for each car to be retrofit.

Third, there is a significant question whether tank shells 7/16" or 1/2" thick can support top fittings complying with the performance standard. Indeed, PHMSA acknowledges this issue in discussing top fittings protection.[10]

3. Thermal Protection and Pressure Relief Devices

PHMSA proposes to require that tank cars transporting flammable liquids contain standard thermal protection systems, addressed in 49 C.F.R. § 179.18(a). These thermal protection systems enable a tank car to withstand a pool fire for 100 minutes and a torch fire for 30 minutes without release of product, except through the pressure release device.

AFFTAC modeling shows the use of thermal blankets on flammable liquid cars can result in a tank car containing flammable liquid withstanding a pool fire for 800 minutes or more without release of product, except through the pressure relief device.

API and AAR, recommend an appropriately-sized pressure relief device for the entire fleet of flammable liquid tank cars and adding a thermal blanket to those cars that are getting new jackets. Blankets made of such materials are available; in fact, some are used on flammable-gas tank cars. This approach will reduce the susceptibility of the tank car to heat-induced failure.

The performance of the tank cars in a pool fire, based on product (crude oil, ethanol, other flammable liquids), using AFFTAC shows that the space between the shell and the jacket acts as an insulating barrier in a pool fire, adding significant interval to the time before failure. This interval is more than twice as long as the DOT standard of 100 minutes of a pressure car. Where a thermal blanket is added to cars with new jackets, the blanket adds significant improvement in how the undamaged cars will perform in the crude-oil pool fire, increasing the time before failure to multiples of the DOT standard and significantly reducing the likelihood of a fire spreading to other cars and a possible loss of containment.

Individually the jacket and the thermal blanket provide more time before failure in a pool fire. When coupled with a modified pressure relief device, they ensure that the tank car will be largely empty before the car has an opportunity to

[10] *See* 79 Fed. Reg. 45,056.

fail.[11] This additional time provides more control following the incident, thus improving stabilization of the accident scene and allowing more reaction time for the fire fighters and emergency responders. It additionally allows the railroads to extract undamaged cars from the accident site.

The risk reduction is significant, though there are economic penalties. There is additional long term maintenance that will be required that is more complicated and costly. During requalification it will be necessary to remove parts of the jacket and to inspect under the thermal blanket or insulation (if there) for corrosion. We believe for new tank cars and retrofit designs this is a cost that that is outweighed by the benefit. **Note:** The industry continues to study the appropriate sizing of the pressure relief valve when used in conjunction with the thermal blanket.

We do not recommend adding a thermal blanket to the CPC-1232 jacketed and DOT-111 jacketed fleet as that would require shopping the tank car, removing the existing jacket, adding the thermal blanket and replacing the jacket. As stated earlier in this section, adding the appropriately-sized pressure relief device to the jacketed fleets more than doubles the DOT standard of 100 minutes for pressure cars.

4. Head Shields

Head shields are a feature that has long been used to prevent punctures for tank cars transporting commodities of significant concern. Head shields reduce a tank car's CPR.

5. Bottom-Outlet Handle Protection

Tank cars with bottom outlets typically travel with operating handles attached to the bottom outlets. In the Cherry Valley accident, several bottom outlets were opened. In its report on the accident, the NTSB discussed this problem and recommended that PHMSA amend its regulations to ensure that bottom outlet valves remain closed when the operating handles are subject to impact forces.[12] Consequently, AAR and API propose that PHMSA require that the bottom handle be configured to prevent it from opening the bottom outlet in an accident on all cars transporting flammable liquids.

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[11] Industry is still studying the implications of having a high-capacity PRD instead of the normally sized valve on tank cars that have a thermal blanket.

[12] NTSB, " Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire Cherry Valley, Illinois June 19, 2009, http://www.ntsb.gov/doclib/reports/2012/RAR1201.pdf, p. 81 (NTSB/RAR-12/01, Feb. 14, 2012).

C. Legacy DOT-111 Non-Jacketed Cars

Under the AAR and API approach, legacy DOT-111 non-jacketed cars would have the same features required for new cars with two important exceptions. The shell thickness would be 7/16" since shells cannot be made thicker and valve protection would be required instead of enhanced top fittings protection. This fleet includes about 50,000 cars (crude and ethanol) (see Table 2).

D. CPC-1232 Non-Jacketed Cars

CPC-1232 non-jacketed cars have a 1/2" shell. Thus, after retrofit there is no difference between the industries' proposed new-car specification and the proposed retrofitted CPC-1232 non-jacketed cars. This fleet includes about 21,000 cars (crude oil and ethanol) when including the cars that will be finished in 2014 and 2015. (see Table 2)

E. Existing Jacketed Cars

Jacketed cars, both in the case of legacy DOT-111 cars and CPC-1232 cars, already have comparatively low CPRs. On the other hand, retrofitting already jacketed cars with thermal blankets is more problematic than installing thermal blankets along with jackets.

Consequently, API and AAR believe it is sufficient to retrofit jacketed cars with an appropriately-sized pressure relief device and bottom-outlet handle protection. This fleet includes about 38,000 (crude and ethanol) cars when including the cars that will be finished in 2014 and 2015. (see Table 2)

Any car retrofitted to the specifications provided in paragraphs A through E should be allowed to operate for their full useful life.

Any contractually committed build orders for new CPC-1232 cars in place prior to the effective date of the final rule would be allowed for their useful life and would not have to be upgraded to the 1/2" shell thickness. It is critical that these cars are not required to be upgraded to a 1/2" shell as it is extremely likely that the 7/16" steel shells have already been purchased.

Table 2. AAR Existing Tank Cars and RSI Committed[13] Tank Car Orders

Car Type / CPR Value	2013	2014 orders	2015 orders	Crude Oil Total	Ethanol	Ethanol and Crude Oil Total
CPC-1232 jacketed (4.57%)	7,685	13,647	9,730	31,062	23	31,085
CPC-1232 non-jacketed (10.3%)	11,364	7,481	1,180	20,025	751	20,776
Legacy-111 jacketed (8.5%)	6,524			6,524	88	6,612
Legacy-111 non-jacketed (19.55%)	22,930			22,930	26,983	49,913
			Total	80,541	27,845	**108,386**

Note: Excludes 38,000 tank cars in Other Flammables service.

II. Retrofit Schedule

PHMSA's analysis has led it to conclude that the proposed tank car designs and timelines would not have deleterious impact on the market for tank cars. In particular, PHMSA concludes that no tank cars would be prematurely retired and that the rule would not impact the transportation of crude oil or ethanol. This is not the case. Indeed, PHMSA makes a number of errors regarding what would be involved in retrofitting existing tank cars, the capacity to retrofit tank cars, and the ability of tank cars to be repurposed to Canadian oil sands trade. When these realities are taken into account, it is clear that shortages of retrofit shop capacity

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[13] Committed tank car orders are contracted to be built for a specific design and will be completed by the end of 2015

would likely lead to premature scrapping of a large part of the existing fleet, jeopardizing the reliable use of rail for crude oil and ethanol transport, with potential associated adverse impacts on crude oil production and ethanol costs.

As part of the agreement on tank car specifications, AAR and API reached an agreement on a retrofit schedule. The schedule was discussed in the context of the transportation of crude oil only. The schedule provided for the retrofit of legacy DOT-111 non-jacketed tank cars within three years, following an estimated six to twelve months needed for the tank car shops to "ramp up." The schedule provided for an additional three years for the non-jacketed CPC-1232 cars, after the three years required for retrofitting the DOT-111 non-jacketed fleet. AAR and API agreed that this approach should not preclude individual company activities to upgrade their fleets early. AAR and API also agree that the jacketed legacy DOT-111 cars and CPC-1232 cars should be retrofitted at the next shopping or qualification. Finally, AAR and API agreed that if the proposed rule were to include other materials such as ethanol and "other flammable liquids" that the schedule could not be met and that the schedule would need to be extended. This additional time would be required due to limits of shop capacity.

With PHMSA's proposed rule including crude oil and ethanol and other flammable liquids, AAR and API are recommending that PHMSA take into account the retrofit schedule AAR and API considered for a crude oil only program in establishing a retrofit schedule encompassing additional commodities. As stated, AAR and API would support placing a priority on crude oil and ethanol since they account for most of the unit train service for flammable liquids. Additionally, PHMSA should account for manufacturing capacity, shop capacity for any retrofits that will be undertaken, the number of DOT-111 cars that need to be phased out of flammable liquid service, and the demand for new DOT-111 cars. AAR and API also support consideration of a prioritized schedule that takes into account the commodity transported, the type of tank car, e.g., non-jacketed legacy DOT-111, jacketed DOT-111, and whether commodities are usually transported in unit trains or manifest service.

Another key element of the AAR and API agreement on a retrofit schedule was that as retrofits progressed, there needed to be a review of the ability to meet the suggested timeline. Accordingly, AAR and API recommend the development of a retrofit review program. The review would address available shop capacity, access to sufficient quantities of materials, availability of skilled labor, and actual progress in manufacturing and retrofitting tank cars and consider what, if any, additional time would be necessary to complete the retrofit schedule.

III. **Conclusion**

AAR and API are committed to the safe transportation of crude oil by rail. The associations believe their proposal to enhance tank car specifications for crude oil serve the public interest by taking a significant step to make a safe transportation system even safer while avoiding significant adverse economic effects.