



ASSOCIATION OF  
AMERICAN RAILROADS

PHMSA  
DOCKET OPERATIONS  
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Via hand delivery and electronic filing

Docket Management System  
U.S. Department of Transportation  
West Building Ground Floor, Room W12-140  
1200 New Jersey Avenue, SE  
Washington, DC 20590-0001

**Re: Docket No. PHMSA-2012-0082 (HM-251)**

Dear Sir or Madam:

By this letter, the Association of American Railroads (AAR) appeals the final rule of the Pipeline and Hazardous Materials Safety Administration (PHMSA) entitled "Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains," 80 Fed. Reg. 26644 (May 8, 2015).<sup>1</sup>

Pursuant to 49 C.F.R. § 106.115, this letter sets forth a "brief statement of [our] concern about the final rule" and an "explanation of why compliance with the final rule is not practical, reasonable, or in the public interest."

The new rule is defective in its approach to regulating the packaging of Class III flammable liquids. Although the rule began as a tank car specification rule in the Advance Notice of Proposed Rulemaking, and the final rule purports to contain tank car standards that most stakeholders agreed were necessary for safe transport of flammable liquids, the rule does not in fact require that all Class III flammable liquids be packaged in tank cars that meet the new standards. Instead, the rule imposes operational limitations and other burdens on the

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<sup>1</sup> The Association of American Railroads is a nonprofit trade association whose members include the Class I freight railroads, as well as many smaller freight railroads and Amtrak. This appeal is brought on behalf of all AAR members other than Union Pacific Railroad.

freight railroads, which do not select the packaging for shipments tendered to them. Whether a particular shipment of a Class III flammable liquid is packaged appropriately now depends on what other freight may ride in the same train with it, not on its characteristics as a hazardous material. Tank cars that do not meet the new specifications—including DOT-111s—can continue to be used to package Class III flammables indefinitely. Moreover, shippers and railroads alike agreed that the current thermal protection requirement for tank cars is inadequate to provide first responders adequate time to respond to an incident. Yet PHMSA ignored without comment the widely supported recommendation to strengthen the thermal protection standard, and left the current standard unchanged.

Furthermore, as demonstrated in the attached reports from Oliver Wyman and the Transportation Technology Center, Inc. (TTCI), the final rule's requirements concerning electronically controlled pneumatic (ECP) braking systems are unreasonable and contrary to the public interest. The requirements cannot be justified based on the real-world experience with ECP brakes, and the administrative record fails to provide a legally sufficient basis to impose yet another multibillion-dollar regulatory burden on the freight railroads. To the extent the reports from Oliver Wyman and TTCI contain new facts that were not presented during the notice-and-comment process, that is because the reports focus on new justifications and analyses introduced for the first time in the final rule.

The only way PHMSA can cure the procedural and technical deficiencies in the final rule is to reinstate a tank car standard that applies to all shipments of all Class III flammables, increase the thermal protection requirement to meet modern standards, and remove the ECP requirements. With respect to the ECP rule, at a minimum PHMSA must reopen the record and re-notice the revised ECP rule to allow a full, fair, and genuine debate about the true costs and benefits of an ECP brake mandate.

**I. PHMSA Should Modify The Final Rule To Require Safer Tank Cars.**

**A. PHMSA Should Require Enhanced Thermal Protection.**

The final rule requires that tank cars transporting flammable liquids in HHFTs have standard thermal protection systems, as defined 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. The ability of tank cars to withstand intense heat generated by a pool fire is a significant concern from the perspective of flammable liquid transportation. In a number of recent accidents involving crude oil, many of the tank cars were breached by thermal tears, not punctures.

As AAR explained in its comment on the proposed rule, the RSI-AAR Project has modeled the survivability of different tank car configurations in a pool fire, using the "Analysis of Fire Effects on Tank Cars" (AFFTAC) model. AFFTAC modeling shows that the use of thermal blankets on flammable liquid cars can result in a tank car containing flammable liquid withstanding a pool fire for hours (or in some situations indefinitely) without release of product, except through the pressure relief device.

Given the safety concern over flammable liquid accidents, thermal blankets should be required when flammable liquid tank cars are built or retrofitted with jackets. Specifically, PHMSA should require a thermal blanket with thermal conductivity no greater than 2.65 BTU per inch, per hour, per square foot, and per degree Fahrenheit at a temperature of 2000 F,  $\pm$  100F. Blankets meeting these specifications are available; in fact, some are used on flammable-gas tank cars.

PHMSA should also require appropriately sized pressure relief devices for tank cars transporting flammable liquids. "Appropriately sized" means sizing the device in conjunction with the tank car's thermal protection to allow the release of only enough commodity to protect against a thermal tear.

There was widespread support during the rulemaking for enhanced thermal protection standards, and PHMSA has offered no justification for its failure to incorporate them into the new rule. Indeed, PHMSA failed even to address AAR's comment in its final rule.

B. PHMSA Should Require The Phase-Out Of Tank Cars Not Meeting The New DOT-117 Standards.

The final rule permits shippers to continue to package Class III flammable liquids in tank cars not meeting the new tank car specifications. Although shippers that want more than 34 tank cars of flammable liquids to move in the same train must use safer cars (as must shippers who want 20 or more tank cars of flammable liquids to move in a single block on a train), no other shippers of flammable liquids are under such a requirement as a result of this rule.

Significant numbers of flammable liquid shipments are tendered in smaller groups of cars. Data from the first quarter of 2015 illustrate that over 55,000 cars of crude oil and ethanol, and an additional 37,000 cars of other flammable liquids, were tendered in blocks of 20 or less. During the same period, 25,009 cars of crude, 39,956 cars of ethanol, and 37,576 cars of other flammable liquids were tendered in groups of fewer than 35 cars. Had the new

rule been in effect, those 102,541 cars of flammable liquids could have moved in existing DOT-111s.<sup>2</sup>

**Crude Oil, Ethanol and Flammable Liquid Shipments  
in Blocks of Fewer Than 35 Cars  
(First Quarter 2015)**

<b>Block Size</b>	<b>Oil</b>	<b>Ethanol</b>	<b>Oil + Ethanol</b>	<b>Other Flammable Liquids</b>	<b>All Flammable Liquids</b>
1-5	12,106	24,862	36,968	31,474	68,442
6-10	2,873	5,099	7,972	4,422	12,394
11-15	2,460	2,517	4,977	994	5,971
16-20	1,213	4,363	5,576	388	5,964
21-25	1,254	1,325	2,579	210	2,789
26-30	4,585	1,074	5,659	56	5,715
31-34	518	716	1,234	32	1,266
<b>Total</b>	<b>25,009</b>	<b>39,956</b>	<b>64,965</b>	<b>37,576</b>	<b>102,541</b>

*Source: Railinc analysis of blocks originating and/or terminating in U.S. with same origin and destination points and times*

PHMSA has failed to justify this gap in the requirement for safe packaging of flammable liquids. Rather than allowing tank cars not meeting the new DOT-117 or -117R standards to remain in service for decades if they are not included in HHFTs, PHMSA should specify a sunset date after which they may not be used.

PHMSA acknowledged in the final rule that “logistical issues” might be avoided by applying the tank car requirements to the transportation of all Class III flammable liquids. 80 Fed. Reg. at 26665. But the agency assumed the problem away: “through fleet management the rail industry will be able to determine the need for cars that will be part of an HHFT.” *Id.* That assumption is baseless. PHMSA has effectively created two pools of tank cars for the transportation of flammable liquids. One pool will meet the heightened safety standards and can be tendered by a shipper and included in any train. But there will be a second group of tank cars that shippers of flammable liquids can still tender to the railroads for movement in non-HHFTs.<sup>3</sup> Because those tank cars will not meet the new safety standards, the railroads will

<sup>2</sup> To the extent a shipper has between 21 and 34 cars of flammable liquid to ship, they can package the shipments in tank cars not meeting the new standards provided the cars will be dispersed throughout the train in groups no greater than 20.

<sup>3</sup> In fact, there will effectively need to be three pools of cars, because tank cars that move in HHFTs must be ECP-equipped.

need to continuously analyze the composition of trains with such cars as they move through the system to ensure that they are not included in an HHFT train—or that they do not create one by being added to a train with other shipments of flammable liquids.

The failure to harmonize the American tank car rules with the Canadian tank car rules will exacerbate the operational complexities. Soon, Canada will have banned the use of any non-retrofitted DOT-111s to transport *any* Class III flammable liquids. But because American shippers could still use those tank cars—forcing the U.S. railroads to manage a fleet of cars they do not own and keep these legacy tank cars from being included in any HHFT—the practical result will be for Canadian non-retrofitted DOT-111 tank cars to flood the American market. This imbalance in tank car regulations will therefore cause the pool of non-compliant tank cars in the United States to swell, making it increasingly difficult to manage the operational complexities of two pools of tank cars. PHMSA properly concluded that because rail transport “is a cross-border issue” and flammable liquids “regularly cross the US / Canadian border using an interconnected rail network,” it is “essential to have a harmonization approach.” 80 Fed. Reg. at 26662. PHMSA should reconsider and harmonize its approach with Canada.<sup>4</sup>

## **II. The ECP Brake Requirements Should Be Removed From The Final Rule.**

PHMSA imposed this unjustified mandate on the railroad industry without following the procedural requirements required by federal law.

The final rule relies on modeling and analysis that were not exposed to public scrutiny. This work cannot reasonably be characterized as a simple update or extension of the original study. Among other differences, the final rule relies on simulation of the behavior of different braking systems within the Sharma & Associates LS-DYNA model, sidestepping critiques of how Sharma and the agency previously handled those issues in the TEDS model. Relatedly, the assumptions about train behavior relied upon by Sharma and the agency appear to differ from those previously used, to the extent they are clear at all. PHMSA frustrated any meaningful scientific debate by not disclosing this modeling and analysis until it released the final rule.

PHMSA also justified the ECP mandate by reference to the supposed experiences of Australian and other foreign railroads. Here too, because PHMSA unveiled this new rationale for the first time in the final rule, it committed procedural error. Had PHMSA invited public input on lessons learned by foreign railroads, it would have learned that those experiences in

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<sup>4</sup> To the extent PHMSA concluded that expanding the scope of the tank car rule to embrace all transportation of Class III flammable liquids was beyond the scope of the rulemaking, see 80 Fed. Reg. at 26665, it can re-notice the proposal for supplemental comments.

fact undercut the agency's reasoning by underscoring the nebulous safety benefits and serious operational difficulties associated with ECP brakes.

Finally, PHMSA pointed to the few U.S. pilot programs as evidence of the feasibility of ECP brakes. Here too, the lack of public input led the agency to a mistaken conclusion. There is a reason why these programs remained pilot programs: the railroads tested the technology and found it lacking. They learned that ECP braking is expensive and suffers from technical difficulties that discouraged widespread adoption.

In addition to these procedural deficiencies, the final rule's requirements concerning ECP brake systems should be withdrawn for many substantive reasons.

**First**, PHMSA ignored the experience of North American railroads that have actually tested ECP brakes in the field. These tests demonstrated that ECP brakes are unreliable and produce results not materially better than conventional trains equipped with distributed power and dynamic braking. This data was made available to PHMSA and the Office of Management and Budget prior to issuance of the final rule. Despite the fact that the Federal Railroad Administration (FRA) provided waivers to conduct some of these tests and committed to collect and analyze the data from these tests, neither FRA nor PHMSA has made an effort since 2010 to collect information from the railroads about their ECP experiences, and they did not incorporate the information they did gather prior to that point into their analysis. *See Wyman Report at 6-17, 34-48.*

**Second**, as noted above, PHMSA inappropriately relied on experience with ECP brakes on Australian and other foreign railroads. Its understanding of this experience appears to be based solely on a brief report by a consultant at a conference, and PHMSA mischaracterized some of the findings from that single source. Had PHMSA made an effort to understand the significant differences between the foreign railroads and North American freight service, it would have quickly concluded that the foreign experiences are not useful test cases. The foreign railroads using ECP brakes are all closed-loop mining railroads that do not interchange with other railroads and rarely break apart train-sets. Their operations bear no resemblance to the complex operations of North American railroads, which depend on the flexibility provided by universally interchangeable equipment and which constantly reconfigure train-sets. Notably, where North American-style operations do exist in Australia, they do not employ ECP brakes. *See Wyman Report at 17-33, 50-54.*

**Third**, PHMSA relied on the purported business benefits of ECP braking as predicted in a 2006 report by Booz Allen Hamilton. The agency made no effort to verify whether subsequent tests in North America, or experience in other countries, validated the predictions, despite

promises to do exactly that. Had PHMSA done so, it would have found that the benefits predicted by Booz Allen Hamilton nine years ago did not materialize in subsequent field tests in North America and operations in foreign countries. The agency further erred by calculating business benefits based on the flawed analysis set forth in the Regulatory Impact Analysis. Many of the inputs the analysis relies on are mistaken, and the result is a significant overestimation of the benefits of ECP brakes. See Wyman Report at 24-48.

**Fourth**, PHMSA relies so heavily on theoretical business benefits that actual experience rebuts because otherwise the agency's own calculation of potential safety benefits of the rule are swamped by its costs. To begin to justify the costs on safety benefits alone, PHMSA would be forced to use an accident-consequences scenario at the far end of probability—one that is only about 10% likely to occur, assuming, *arguendo*, that PHMSA's calculations about the probabilities of accidents and associated costs are correct.

**Fifth**, PHMSA vastly understated the cost of implementing ECP braking. The actual cost will be more than six times PHMSA's estimate. PHMSA underestimated the cost—by more than \$2.5 billion—because it assumed that ECP brake-equipped tank cars and locomotives will run almost entirely in dedicated sets, segregated from the rest of the fleet. In fact, segregated fleets are not operationally possible. Locomotives used for crude oil trains are, and will be, commingled with the tens of thousands of locomotives that operate in North America, and they will operate over the majority of the transcontinental North American network. Accordingly, almost 10 times as many locomotives will need to be equipped with ECP as estimated by PHMSA, along with the attendant training and maintenance expenses. For similar reasons, the estimate of the number of tank cars needed for ECP service is understated by more than 25 percent. See Wyman Report at 49-70.

**Sixth**, PHMSA ignored the significant collateral damage that will be caused by mandating ECP brakes. Because ECP brakes have been shown in repeated tests to be unreliable, it is likely that their deployment will disrupt major arteries in the national railroad network and will degrade the performance and capacity of the network. In addition, it may delay implementation of Positive Train Control, which FRA has defined as a safety-critical system. See Wyman Report at 78-112.

**Seventh**, as noted above, PHMSA erred by calculating safety benefits based on a new report prepared by Sharma & Associates, an engineering consulting firm. The analysis set forth in the new Sharma report and Regulatory Impact Analysis is deficient and rests on numerous flawed assumptions. Moreover, the new Sharma report fails to adequately justify—or even

explain—many aspects of its modeling methodology and the underlying assumptions. See TTCI Report at 2-8.

**Eighth**, the rule ignores the PTC integration challenges presented by ECP, including the development of new braking algorithms and installing two new complex technologies on locomotives. Of particular concern is the difficulty in developing the capability of the PTC system to recognize different braking systems and the potential for additional unintended brake applications. See Wyman Report at 108-112.

**Ninth**, the rule fails to address or mitigate the harmful impact on small businesses, including Class III railroads, commuter railroads, and smaller contractors and hazardous materials shippers. Federal law—including the Small Business Regulatory Enforcement Fairness Act of 1996, the Regulatory Flexibility Act, and the Equal Justice Act—require PHMSA to assess the impact of its rule on small business and consider less burdensome alternatives.

Small railroads are affected by the ECP brake mandate because they accept unit trains of crude oil (and other trains that trigger the mandate) from Class I railroads. Although we doubt that PHMSA intended for small railroads to have to deal with the many challenges arising from the ECP brake mandate, the final rule does not sufficiently protect small businesses in several key respects.

For example, by accepting trains from Class I railroads, small railroads will assume responsibility for troubleshooting ECP brake-related problems. But this type of troubleshooting requires expertise beyond the reach of most small railroads. Unlike Class I railroads, most small railroads do not have the resources to hire trained electronics engineers with the necessary expertise to identify the source of ECP system failures.

Moreover, where the interchange agreement requires the small railroad to use its existing power, that railroad would need to equip its locomotives with ECP brakes for handling interchanged unit trains. This would be an enormous expense for a small railroad, especially since most small railroads have older locomotives that are not processor-based and that lack the required space to install an ECP brake system. We estimate that it would cost approximately \$250,000 to equip a non-processor-based locomotive with ECP brakes.

**Tenth**, the ECP brake mandate is prohibited by 49 U.S.C. § 20141. That statute provides that the Secretary of Transportation “shall require 2-way end-of-train devices (or devices able to perform the same function) on road trains, except locals, road switchers, or work trains, to enable the initiation of emergency braking from the rear of a train.” By directing freight railroads to install ECP brakes instead of 2-way end-of-train devices, PHMSA has overridden the



congressional directive and abandoned the statutorily-mandated use of 2-way end-of-train devices in favor of a different device.

To be sure, the statute provides that “[t]he Secretary may consider petitions to amend the regulations prescribed under . . . this subsection to allow the use of alternative technologies that meet the same basic performance requirements established by the regulations.” But this just confirms that PHMSA has violated the statute and exceeded its authority. PHMSA changed the existing brake requirements *not* through a petition to amend the regulations but through an agency-instigated rulemaking. Moreover, whereas Congress authorized the use of “alternative technologies,” it directed that they must meet “the same basic performance requirements.” Here, the ECP brake mandate imposes substantially different performance requirements.

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In addressing the litany of known technical and operational issues with ECP brakes, PHMSA states that “[t]hese are issues that can arise with any new technology, but they do not evidence a problem with the technology itself.” Final RIA at 223. Sometimes, however, the issues revealed through rigorous testing of new technology *do* evidence a problem with the technology itself. For the reasons discussed above, we respectfully ask that PHMSA remove the ECP mandate from the final rule or, at a minimum, reopen the record to enable the presentation of supplemental evidence and comments. In addition, we ask that PHMSA make the two additional modifications concerning enhanced thermal protection and the phase-out of tank cars not meeting the new DOT-117 standards.

Respectfully submitted,

A black rectangular redaction box covering the signature of Kathryn D. Kirmayer.

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