Institute *for* Policy Integrity

new york university school of law

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VIA ELECTRONIC SUBMISSION

Anthony R. Foxx, Secretary
U.S. Department of Transportation

Cynthia Quarterman, Administrator
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation

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

Subject: **Comments on proposed enhanced tank car standards and operational controls for High-Hazard Flammable Trains, 79 Fed. Reg. 45016 (Aug. 1, 2014)**

The Institute for Policy Integrity ("Policy Integrity") at NYU School of Law[1] respectfully submits the following comments on the Pipeline and Hazardous Materials Safety Administration's ("PHMSA") proposed enhanced tank car standards and operational controls for High-Hazard Flammable Trains ("HHFTs").

Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

With this Proposed Rule, PHMSA steps into an area of tremendous national importance. Driven by growth in the production of fracked oil in the U.S. and Canada, there has been a significant increase in rail transportation of crude oil over the past five years, with a corresponding increase in the number of accidents involving releases of crude oil.[2]

In 2008, 9,500 tank car loads of crude were transported by rail in the United States. That number increased to more than 400,000 car loads in 2013.[3] With each tank car carrying approximately 30,000 gallons, this amounts to about 12 billion gallons per year.

The number of mainline train accidents in North America involving crude oil has also increased from zero in 2010 to ten major accidents in 2013 and 2014, to-date.[4] In 2013, more oil spilled from

[1] No part of this document purports to present New York University School of Law's views, if any.
[2] Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains, 79 Fed. Reg. 45016, 45019 (Aug. 1, 2014) (hereinafter "HHFT Proposed Rule").
[3] Association of American Railroads, "AAR Reports Crude Oil Traffic up for 2013, Week 10 Traffic Remains Mixed," (March 13, 2014), available at https://www.aar.org/newsandevents/Freight-Rail-Traffic/Pages/2014-03-13-railtraffic.aspx.

U.S. trains than in the previous four decades combined.[5] These crude-by-rail accidents have resulted in serious damage to the environment as well as fatalities—47 people died in the Lac-Mégantic, Quebec accident.

Rail shipments of crude oil are expected to continue to rise through the next decade, as domestic and Canadian oil production increases.[6] Much of the recent growth in oil production has occurred in the Bakken region of North Dakota, Montana, and Canada. The U.S. Department of Transportation ("DOT") and PHMSA have warned that Bakken crude oil is particularly dangerous due to its low flashpoint and flammability.[7]

The National Transportation Safety Board ("NTSB") has cautioned that: "The sharp increase in crude oil rail shipments in recent years as the United States experiences unprecedented growth in oil production has significantly increased safety risks to the public."[8] Federal action is needed to reduce the heightened risk of accidents, as society bears the costs of more frequent and more severe train accidents. These costs include potential human fatalities, injuries, property damage, environmental damage, disruption of business, emergency response time, and clean-up costs.

Several market failures give rise to the need for federal regulation. Oil companies, tank car owners, and railroads do not absorb the entire cost of accidents. Shippers and rail companies may not be adequately insured against the highest-cost accidents.[9] Rail carriers, as common carriers, cannot refuse shipments. Further, environmental harm from accidents is an externality that makes government intervention necessary. In addition to these market failures, federal action to set new tank car design standards, routing requirements, and speed limits is especially important in light of federal preemption of state standards in these areas.[10]

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[4] HHFT Proposed Rule, 79 Fed. Reg. at 45019; Pipeline and Hazardous Materials Safety Administration Data, available at https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/search.aspx.

[5] Curtis Tate, "More oil spilled from trains in 2013 than in previous 4 decades, federal data show," *Kansas City Star* (Jan. 24, 2014), available at http://www.kansascity.com/news/article336906/More-oil-spilled-from-trains-in-2013-than-in-previous-4-decades-federal-data-show.html#/tabPane=tabs-3eebbd11-1 (analyzing PHMSA data).

[6] Congressional Research Service, U.S. RAIL TRANSPORTATION OF CRUDE OIL: BACKGROUND & ISSUES FOR CONGRESS (Feb. 6, 2014) at 1; Association of American Railroads, *Moving Crude Petroleum by Rail*, (Dec. 2012) at 1, available at https://www.aar.org/keyissues/Documents/Background-Papers/Moving%20Crude%20Petroleum%20by%20Rail.pdf.

[7] Pipeline and Hazardous Materials Safety Administration, *Safety Alert: Preliminary Guidance from Operation Classification* (Jan. 2, 2014), available at http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_111F295A99DD05D9B698AE8968F7C1742DC70000/filename/1_2_14%20Rail_Safety_Alert.pdf.

[8] NTSB Recommendations 14-1 through 14-3, at 4 (Jan. 23, 2014); FRA, Emergency Order 28, 78 Fed. Reg. 48,218, 48,220 (Aug. 7, 2013).

[9] Department of Transportation and Pipeline and Hazardous Materials Safety Administration, DRAFT REGULATORY IMPACT ANALYSIS, HAZARDOUS MATERIALS: ENHANCED TANK CAR STANDARDS AND OPERATIONAL CONTROLS FOR HIGH-HAZARD FLAMMABLE TRAINS; NOTICE OF PROPOSED RULEMAKING (hereinafter "RIA") (July 2014) at 17. One example of this occurred in the 2013 Lac Mégantic, Quebec catastrophic accident, where the rail carrier's insurance coverage was far lower than the actual harm caused; the rail carrier declared bankruptcy.

[10] The Federal Rail Safety Act, 49 U.S.C. § 20106, and Federal Hazardous Material Transportation law, 49 U.S.C. § 5125, preempt state and local regulation of railroad tank car design standards, hazardous material classification, routing, and speed. State authority to adopt railroad safety rules is expressly preempted by the FRSA, subject to a limited savings clause: States may adopt regulations "related to railroad safety until the Secretary of Transportation ... prescribes a regulation or issues an order covering the subject matter of the

In this Proposed Rule, PHMSA proposes important changes to tank car design standards, routing analysis, and speed limits, which are designed to reduce the number and severity of accidents involving High-Hazard Flammable Trains ("HHFTs"). This Proposed Rule defines a HHFT as a train comprised of 20 or more carloads of a Class 3 flammable liquid. This rule primarily affects unit trains carrying Bakken crude oil and ethanol, which are Class 3 flammable liquids frequently transported in unit trains with 20 or more cars.[11]

Through this rulemaking, the agency is taking steps to increase public safety. However, a more thorough and transparent analysis of the proposed rule is necessary to ensure that the final rule maximizes net benefits. Specifically, PHMSA should:

- Explain the rationale for its selected alternatives, and consider additional options that would increase safety;
- Improve its calculation of costs and benefits by using the best available data, and fully account for co- benefits and countervailing risks;
- Provide more detailed guidance on how to perform routing analysis to maximize net benefits;
- Collaborate with states to increase compliance with federal regulations; and
- Collect more accurate data on accident causes, and continuously improve safety standards.

We urge PHMSA to consider these recommendations, which may require minor changes to its analysis. These recommendations should not delay the implementation of important safety improvements, and are intended to assist the agency in promulgating a final rule that provides maximum safety benefits consistent with cost-benefit analysis.

I. PHMSA should explain the rationale for its selected alternatives, and consider additional options that would increase safety.

PHMSA is required by Executive Orders 12,866 to "assess both the costs and the benefits of the intended regulation and . . . adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs."[12] This executive order further provides that, "analysis of the risks, benefits, and costs associated with regulation must be guided by the principles of full disclosure and transparency."[13] Executive Order 13,563 reaffirms these principles.[14]

In line with executive branch guidance, PHMSA analyzes the benefits and costs of different regulatory provisions and alternatives separately.[15] However, PHMSA should be transparent about its assumptions and the tradeoffs involved in its analysis. Without a careful, transparent approach to this regulation, it is difficult for the public to understand the full range of alternatives, and their potential net costs and benefits.

State requirement." 49 U.S.C. § 20106(a)(2). States do play an important role in inspection and compliance under the State Rail Safety Participation Program. *See* 49 C.F.R. Part 212.

[11] Currently, Bakken crude oil and ethanol are typically classified as Class 3 flammable liquids. HHFT Proposed Rule, 79 Fed. Reg. at 45017. Within Class 3, light sweet crude oil, such as that coming from the Bakken region, is typically assigned to packing group I or II. This means the materials pose significant fire risk if released from the package in an accident.

[12] Exec. Order No. 12,866 §§ 1(a), 6(3)(C)(iii), 58 Fed. Reg. 51,735, 51,735, 51,741 (Oct. 4, 1993) (codified at 45 C.F.R. pt. 88).

[13] Executive Order No. 12,866 § 1(b)(5), 58 Fed. Reg. 51,735 (Sept. 30, 1993).

[14] Executive Order No. 13,563 § 1(b), 76 Fed. Reg. 3821, 3821 (Jan. 18, 2011) (affirming cost-benefit principles specified in Exec. Order 12,866).

[15] *See, e.g.*, RIA at 181-192.

Specifically, the agency should explain its rationale for allowing dangerous DOT-111 tanks cars to remain in operation transporting flammable Bakken crude for up to four years, and allowing them to transport tar sands oil indefinitely. The agency should explain the rationale for its chosen timeline, and whether an accelerated timeline is feasible. In addition, PHMSA should consider additional alternatives that may increase safety.

- **PHMSA should assess the feasibility and potential net benefits of phasing in enhanced tank cars on an accelerated timeline, and removing DOT-111 cars more quickly.**

The Proposed Rule would require new tank cars constructed after October 1, 2015 to meet one of three design requirements: the FRA and PHMSA Designed Car, the AAR 2014 Tank Car, and the jacketed CPC–1232 Tank Car. The FRA and PHMSA Designed Car provides the greatest safety benefits, as well as the greatest net benefits, relative to the other tank car options, according to the agency's Draft Regulatory Impact Analysis. [16]

PHMSA sets forth a phased approach for the new design standards, requiring the new standards to be used for all HHFTs transporting Packing Group I flammable materials by Oct. 2017; Packing Group II by 2018; and Packing Group III by 2020.[17] Currently, Bakken crude oil and ethanol are assigned to Packing Groups I or II, as they pose significant fire risk if released in an accident.[18] The rule would require existing tank cars used as part of a HHFT to be retrofitted to meet the selected performance standard.

Tank cars that are not retrofitted could still be operated in HHFTs under one of three speed restrictions for up to five years: a 40-miles-per-hour (mph) maximum in all areas; a 40-mph speed restriction in "high-threat urban areas"; or a 40-mph speed restriction in areas with populations of 100,000 or more. This "exception" to the new standards includes DOT-111 tank cars, which are known to puncture in the event of an accident.[19]

There are more than 270,000 DOT Specification 111 tank cars in the existing fleet; approximately 72,000 of these cars transport crude oil, including flammable Bakken crude oil. The timeline set forth by PHMSA would allow all of these DOT-111 tank cars to continue in operation for up to an additional five years. Allowing DOT-111 tank cars to be used through 2018 for Bakken crude oil (in Packing Group II) is especially troubling in light of NTSB reports dating back to 1991 detailing their high puncture and failure rates.[20]

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[16] *See* RIA at 187-190.

[17] Crude oil may fall into any one of these three categories, depending on its characteristics, with the most volatile crude classified as Packing Group I.

[18] Pipeline and Hazardous Materials Safety Administration, Safety Alert: Preliminary Guidance from Operation Classification (Jan. 2, 2014), available at http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_111F295A99DD05D9B698AE8968F7C1742DC70000/filename/1_2_14%20Rail_Safety_Alert.pdf.

[19] NTSB indicated that DOT111 cars "can almost always be expected to breach in the event of a derailment resulting in car-to-car impacts or pileups." RIA at 73.

[20] NTSB conducted a 1991 safety study that examined the performance of eighty-four DOT-111 tank cars. The study found that 54 percent of the DOT-111 cars involved in these accidents released product, and the rate at which the DOT-111 tank cars experienced head or shell punctures or failures was double that of other pressure tank cars. The NTSB concluded that the DOT -111 tank cars have a high incidence of failure when involved in accidents. Transport of Hazardous Materials by Rail, Safety Study NTSB/SS-91-01 (Washington, DC: National Transportation Safety Board, 1991).

Canadian officials moved faster. In April, they ordered 5,000 DOT-111 tanker cars to be removed from Canadian railways immediately, and another 65,000 cars to be removed or retrofitted by April 2017.[21]

PHMSA fails to explain whether an accelerated timeline for the new design standards is feasible, and if so, how much this would add to the overall cost of the regulatory program, as compared to the benefits.[22] In addition, the agency fails to explain whether an accelerated *phase-out* of the DOT-111 tank cars is feasible and cost-benefit effective. Waiting an additional year (or more) for DOT-111 cars to be removed from Bakken crude oil service entails another year in which dangerous crude oil tank cars continue to share track with commuter rail in many areas of the country,[23] travel through dense population centers, and cross water bodies and other sensitive habitats.

PHMSA's own analysis shows that the benefits of the FRA and PHMSA Designed Car exceed the benefits of a 40-mph speed limit, regardless of where this speed limit is applied.[24] Yet, PHMSA presents no alternative that would end the use of DOT-111 cars sooner. If manufacturing backlogs make this impossible, the Department of Transportation should consider eliminating DOT-111s faster in the highest threat areas.

PHMSA should assess the feasibility as well as the costs and benefits of phasing in the enhanced tank cars on an accelerated schedule, and removing DOT-111s from Bakken crude oil service more quickly. Without this analysis, the public lacks adequate information about possible net benefits that could be achieved through a more ambitious timeline.

- **PHMSA should explain the risks presented by DOT-111 cars transporting tar sands oil, and consider extending the Proposed Rule to Bakken and tar sands oil.**

PHMSA assumes that approximately 23,000 DOT-111 tank cars that are not retrofitted to comply with the new design standards will be transferred to "tar sands service" beginning in 2016.[25] The environmental, social, and economic risks posed by the transfer of DOT-111 cars to tar sands service may be very high. NTSB has stated that DOT-111 cars "can almost always be expected to breach in the event of a derailment resulting in car-to-car impacts or pileups,"[26] and PHMSA notes that, "DOT Specification 111 is significantly more likely to puncture than the proposed alternatives."[27] PHMSA should more fully explain how tar sands oil is classified and the risks that it presents. It should also consider a more fundamental revision to the Proposed Rule that would extend the rule to all crude oil transported by rail.

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[21] Jeff Lacroix-Wilson, "Transport Canada Orders 5,000 Most Dangerous Tanker Cars Off Rail System," Postmedia News (April 23, 2014), available at http://business.financialpost.com/2014/04/23/canada-to-phase-out-in-3-years-old-rail-tankers-of-type-that-exploded-in-lac-megantic-disaster/.
[22] *See* RIA at 89-90.
[23] *See* Curtis Tate, "Crude oil crosses paths with two Philadelphia commuter train lines," *McClatchy DC* (Aug. 19, 2014), http://www.mcclatchydc.com/2014/08/19/236850/crude-oil-crosses-paths-with-two.html.
[24] RIA at 192. NTSB conducted a 1991 safety study that examined the performance of eighty-four DOT-111 tank cars. The study found that 54 percent of the DOT-111 cars involved in these accidents released product, and the rate at which the DOT-111 tank cars experienced head or shell punctures or failures was double that of other pressure tank cars. The NTSB concluded that the DOT -111 tank cars have a high incidence of failure when involved in accidents. Transport of Hazardous Materials by Rail, Safety Study NTSB/SS-91-01 (Washington, DC: National Transportation Safety Board, 1991).
[25] HHFT Proposed Rule, 79 Fed. Reg. at 45060; RIA at 81, 109.
[26] RIA at 73.
[27] RIA at 73.

As a threshold matter, the agency should explain how it defines "tar sands oil," and articulate how tar sands oil would be classified under this Proposed Rule and existing regulations. The agency refers to tar sands oil generally, without distinguishing between tar sands oil in the form of raw bitumen, versus "diluted bitumen," or oil diluted with substances like natural gas condensate for the purpose of reducing viscosity and density. Bitumen can be diluted to differing degrees, which affects its flammability.[28] A spokesperson for PHMSA recently stated that diluted bitumen would qualify as a flammable Class 3 material in Packing Groups II or III (making it subject to the Proposed Rule's requirements for HHFTs), whereas raw bitumen (which has a higher flashpoint) would be a combustible liquid falling outside the HHFT definition.[29] Transporting raw bitumen requires insulated tank cars with heating coil technology. In the Draft Regulatory Impact Analysis, PHMSA includes retrofit costs for DOT-111 cars that will need to add insulation and heating coils in order to transport tar sands oil.[30] The agency describes "tar sands oil" as heavy crude oil with a higher flashpoint than Bakken crude, but says nothing about diluted bitumen.

A spill involving tar sands oil could be equally devastating to the environment, public health, and the economy as a spill involving Bakken oil. Train derailments involving tar sands oil can leave behind toxic heavy metals, pose public health risks, and be extremely difficult to clean-up. A 2010 pipeline spill of tar sands oil into Michigan's Kalamazoo River took more than four years and cost more than $1 billion to remediate.[31] Raw and diluted bitumen are also particularly GHG-intensive, and may pose local air pollution effects near refineries. The U.S. Energy Information Administration observed that tar sands bitumen "can contain undesirable quantities of nitrogen, sulfur, and heavy metals."[32] PHMA recently announced that it is planning to study the effects of spills involving diluted bitumen to human health and the environment.[33]

The amount of raw versus diluted bitumen shipped by rail may also alter the Proposed Rule's costs and benefits. The agency's assumption that 23,000 DOT-111 tank cars will avoid costly retrofits appears to be based on its assumption that these cars will move raw bitumen; this assumption could be proven wrong. More diluted bitumen could be moved by rail if dilution techniques advance; many rail terminals are currently able to accept Bakken crude and diluted bitumen, but are not yet equipped to handle raw bitumen.[34] While the Proposed Rule's compliance costs for

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[28] For example, in the Keystone XL Pipeline Environmental Impact Statement, the U.S. Department of State writes, "The most economical way to transport oil sands crude by rail is not as dilbit (which comprises around 70-75 percent bitumen with 30-25 percent diluent) but rather as either railbit (around 15-20 percent diluent) or as undiluted bitumen (zero diluent)." U.S. Department of State, DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT KEYSTONE XL PROJECT (March 2013) at 1.4-47.

[29] Elana Schor, "Canadian oil sands crude is the X factor in crude-by-rail rule," Energy Wire (Aug. 13, 2014), available at http://www.eenews.net/energywire/stories/1060004416.

[30] RIA at 80.

[31] Elizabeth Shogren, "When This Oil Spills, It's 'A Whole New Monster'," NPR All Things Considered (August 16, 2012.

[32] U.S. Department of Energy, Energy Information Administration, ANNUAL ENERGY OUTLOOK ANALYSIS 2006 – NONCONVENTIONAL LIQUID FUELS (2006), available at http://www.eia.doe.gov/oiaf/aeo/otheranalysis/aeo_2006analysispapers/nlf.html.

[33] Statement by PHMSA Administrator Cynthia Quaterman, U.S. Congressional Hearing, "A Review of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011" (May 20, 2014), available at http://transport.house.gov/calendar/eventsingle.aspx?EventID=379545 ("As a part of our 2014 budget, there was a requirement that we do a further study to evaluate whether dilbit [diluted bitumen] spills are more risky than spills of other crudes…. We are in the process of finalizing a contract with the National Academy of Sciences to do that study.")

[34] *See, e.g.*, U.S. Department of State, DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT KEYSTONE XL PROJECT (March 2013) at 1.4-37, n. 31 ("Much of the public reporting surrounding the construction of these

industry may increase if more diluted bitumen is moved by rail—as diluted bitumen is a Class 3 flammable liquid subject to the Proposed Rule's requirements—the safety and environmental benefits of this Proposed Rule should also be expected to increase.

A more fundamental revision to the Proposed Rule would allow the agency to conduct this analysis now, rather than wait for the anticipated influx of tar sands oil in 2016.[35] The agency should consider extending some or all components of this rule to rail carriers transporting any crude oil. Applying the Proposed Rule to all crude oil would cover "tar sands oil," in all known forms: raw and diluted, including various degrees of dilution. This approach would eliminate the use of dangerous DOT-111 tank cars for tar sands oil on the same schedule proposed for Bakken crude and ethanol, providing consistency and potentially greater safety and environmental benefits.

Even if the agency decides not to extend this rule to all crude oil, it should explain in more detail the risks that society will bear if DOT-111 cars are used for tar sands oil service. Further, the Department of Transportation should still consider extending the prevention-specific components of this rule to all crude oil transportation, such as the routing analysis (described in Part III) and state notification requirements (described in Part IV).

- **DOT should consider making Positive Train Control mandatory for all HHFTs, or prioritize its implementation on routes experiencing the most crude-by-rail traffic**.

In addition to improved tank car standards, the Department of Transportation should consider requiring Positive Train Control ("PTC") as soon as feasible on all HHFT and other hazardous materials routes. The Rail Safety Improvement Act of 2008 ("RSIA"), mandated the implementation of PTC systems by December 31, 2015, on freight railroad track that is shared with commuter rail, as well as freight rail corridors that move any amount of certain highly toxic materials.[36] There are safety benefits to PTC and there may be economies of scale to requiring PTC implementation on HHFT routes. The Department of Transportation should consider conducting a cost-benefit analysis for implementing PTC on all HHFT routes. If this is cost-prohibitive or infeasible, the Department could prioritize PTC implementation on areas of track where crude oil traffic is heaviest or poses the greatest risk. The current analysis contains no information about the parallel PTC effort.

- **DOT should require rail carriers to demonstrate the financial capacity to address the risks of shipping crude-by-rail and other hazardous materials**.

The Department of Transportation should consider requiring rail carriers and shippers to demonstrate financial fitness and maintain adequate levels of liability insurance.[37] The Proposed Rule and Draft Regulatory Impact Analysis list potential "higher consequence" safety events that could exceed $1 billion, or even $5.75 billion on the high end of the range.[38] However, current insurance coverage limits for rail carriers are not sufficiently high to cover the potential harm from such high consequence accidents. The maximum coverage available for commercial rail insurance

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[rail] terminals has focused on their ability to accept light crude. If rail cars hauled dilbit at pipeline specifications, they could unload at any of the terminals indicated...")

[35] RIA at 81.

[36] Rail Safety Improvement Act, Pub. L. No. 110-432, div. A, 122 Stat. 4848 (Oct. 2008).

[37] Requirements exist for rail or motor carriers to demonstrate their financial fitness when seeking various forms of authority from the Administration for general common carriage. *See* 49 C.F.R. Parts 387 and 1150.

[38] HHFT Proposed Rule, 79 Fed. Reg. at 45064.

appears to be $1 billion per incident; most of the largest railroads commonly carry between $25 and $50 million, and smaller railroads often carry far less.[39]

Federal law charges the Surface Transportation Board, an agency within the Department of Transportation, with promoting the safety and efficiency of the rail system.[40] Surface Transportation Board regulations require rail carriers to demonstrate proof of liability insurance, although they do not prescribe insurance coverage minimums.[41]

The Department of Transportation should work with rail carriers, shippers, and insurance companies to discuss higher insurance coverage limits. This issue is complex: railroads face untenable liability exposure because they are required to transport flammable and dangerous materials pursuant to their federally-mandated common carrier duty.[42] Railroads have acknowledged that the potential for an accident cannot be fully eliminated, and "insurance is not commercially available to sufficiently protect [them] against catastrophic loss."[43] Union Pacific Railroad, for example, recently petitioned the Surface Transportation Board to allow it to require that shippers of highly toxic and dangerous materials meet reasonable indemnity and insurance requirements and share liability coverage with the railroad.[44] While the Surface Transportation Board denied Union Pacific's petition, it should closely evaluate options that would allow railroads to carry out their common carrier obligations, while ensuring that any financial risks are not uncontrolled. New legislation may be necessary to ensure appropriate risk allocation among the railroads, shippers, and the public. [45]

II. PHMSA should improve its calculation of costs and benefits by using the best information available and fully accounting for direct and ancillary benefits, as well as countervailing risks.

Thorough cost-benefit analysis is required under Executive Orders 12,866 and 13,563. Executive Order 12,866 provides that costs and benefits must be understood by agencies "to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider."[46] Executive Order 13,563 provides that, "each agency is directed to use the best available

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[39] RIA at 17.
[40] *See* 49 U.S.C. § 10101, *et. seq*. ("Rail Transportation Policy Guidelines").
[41] *See* 49 C.F.R. 1150.23(b)(4); 49 C.F.R. 1151.3(a).
[42] *See* 49 U.S.C. § 11101(a); *see also Pejepscot Indus. Park, Inc*., 6 S.T.B. 886, 898 (2003) (citing *Decatur Cnty. Comm'rs v. STB*, 308 F.3d 710, 715 (7th Cir.2002)) ("[a]pplicants for common carrier authority… cannot lawfully make fulfilling their statutory obligations contingent upon whether they think it is 'worth it' to do so"; "a carrier must adhere to its statutory obligations even if it suffers hardship in so doing.").
[43] BNSF Railway Company, Ex Parte No. 677(Sub-No.1) Common Carrier Obligation of Railroads-Transportation of Hazardous Materials (July 22, 2008), available at http://www.bnsf.com/media/speeches/pdf/EP677JulyHrgPrestnDr7-21-08.pdf.
[44] Union Pacific Railroad Company, Petition for Declaratory Order, Surface Transportation, Board Docket No. FD 35504 (April 30, 2013), available at http://www.stb.dot.gov/decisions/readingroom.nsf/UNID/9201300C7096C27485257B5C0062F704/$file/42820.pdf.
[45] For example, the American Association of Railroads has advocated for a "Price-Anderson Act" or similar federal legislation to create a fair liability sharing regime. The Price-Anderson Act requires Nuclear Regulatory Commission licensees and Department of Energy contractors to enter into agreements of indemnification to cover personal injury and property damage to those harmed by a nuclear or radiological incident, including the costs of incident response or precautionary evacuation.
[46] Executive Order No. 12,866 § 1(b)(5), 58 Fed. Reg. 51,735 (Sept. 30, 1993).

techniques to quantify anticipated present and future benefits and costs as accurately as possible."[47] In addition, cost-benefit analysis should also "look beyond the direct benefits and direct costs of your rulemaking and consider any important ancillary benefits and countervailing risks."[48]

PHMSA's cost-benefit analysis could be improved by reevaluating its cost per gallon figure, and accounting for all benefits, such as the accident prevention benefits attributable to lower train speed limits. Further, it should account for countervailing risks that may impact its cost-benefit analysis.

PHMSA should use the best information available to quantify anticipated costs and benefits.

As a threshold matter, PHMSA should use the best information available to calculate costs and benefits. PHMSA estimates the property and environmental damage from released oil or ethanol by applying a monetary value to each gallon spilled. PHMSA bases its net benefit calculation, in part, on a "cost per gallon spilled" figure derived from a single train accident on April 30, 2014.[49] Based on this incident in Lynchburg, Virginia, PHMSA uses $300 per gallon of crude oil spilled as an "average" number that it subsequently applies in the remainder of its analysis to quantify regulatory benefits.

PHMSA elected to use the Lynchburg incident because it believes it has "accurate data" on the costs involved, including spill remediation, property damage, environmental damage, evacuation costs, and emergency response. But the agency itself noted several problems with data from other past accidents: cost discrepancies were not discovered until months after the accident and "cleanup costs also tend to escalate after an initial report."[50] Further, the Lynchburg figure is based only on data reported by CSX, the rail carrier responsible for the accident.

If possible, the agency should set a cost per gallon figure derived from more than one recent incident, verified by multiple sources. The Lynchburg incident may not be representative of typical costs; many of the other incidents listed in the Regulatory Impact Analysis involved significantly more derailed cars and gallons released.[51] In the coming months, PHMSA may also discover that the actual costs of the Lynchburg incident are much higher. As such, the agency should attempt to calculate a more representative cost per gallon figure using an average of multiple incidents.

PHMSA should account for the accident prevention benefits of reduced speed in its cost-benefit analysis, which may increase net benefits.

Reduced speeds would provide greater safety benefits because they would presumably lead to fewer and less severe accidents, but they would also have greater costs. PHMSA should evaluate whether the net benefits are greater for lower speed limits. In doing this analysis, it should account for the accident prevention benefits of reduce speed, which are currently missing from the analysis. To fully account for the environmental, social, and economic costs and benefits of the Proposed Rule, PHMSA should quantify and include the prevention benefits of reduced speed, which may increase the net benefits of reduced speed limits.

This Proposed Rule contains a number of different speed limits—some mandatory and some posed as temporary compliance options for HHFTS that do not meet enhanced tank car design standards.

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[47] Executive Order No. 13,563 § 1(b), 76 Fed. Reg. 3821, 3821 (Jan. 18, 2011).
[48] OFFICE MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, CIRCULAR A-4 (2003) [hereinafter CIRCULAR A-4], available at http://www.whitehouse.gov/omb/circulars_a004_a-4.
[49] RIA at 28.
[50] RIA at 30.
[51] *See* RIA at 19 (Table 1: Major Crude Oil/Ethanol Accidents in the U.S. (2006-2014)).

The proposed rule restricts all HHFTs to 50-mph everywhere, and would apply one of three additional speed restrictions on HHFTs that contain any tank cars *not* meeting the enhanced tank car standards proposed by this rule: (1) a 40-mph maximum speed restriction in all areas; (2) a 40-mph speed restriction in high threat urban areas, or (3) a 40-mph speed restriction in areas with a 100K+ population.[52] It would also apply a 30-mph speed restriction for HHFTs that do not comply with enhanced braking requirements.[53]

PHMSA states that it "only quantifies benefits in this proposed [speed restriction] rule from mitigating the *severity* of accidents. With respect to *prevention*, PHMSA notes that reduced speeds will reduce the risk of accidents on net, though some risks could increase under limited circumstances."[54]

The omission of prevention benefits is puzzling, as PHMSA acknowledges the direct relationship between train speed and derailment rates in a number of places in the Proposed Rule and Draft Regulatory Impact Analysis. In the Proposed Rule, PHMSA states, "Speed is a factor that may contribute to derailments. Speed can influence the probability of an accident, as it may allow for a brake application to stop the train before a collision."[55] And in the Draft Regulatory Impact Analysis, PHMSA acknowledges that "reducing train speed can reduce the number of cars that derail, as well as the likelihood that product will be released from those tank cars."[56] Further, one of the recent accidents that PHMSA cites to support the need for this rulemaking involved "a train transporting crude oil, which had too little time to stop before it collided with [a] grain train, and then itself derailed and unintentionally released product, which ignited near Casselton, North Dakota."[57]

PHSMA should justify its decision not to quantify the accident prevention benefits of lower speed limits. The agency fully accounts for the costs of reduce speed limits, creating an imbalanced analysis. The prevention benefits of reduced speed limits appear to be greater than zero, as a number of studies have found a direct relationship between train speed and derailment rates.[58]

By contrast, PHMSA estimates the average cost of train delay due to speed restrictions at $500 an hour, based on reviewing costs associated with "crew members, supply chain logistic time delays… and passenger operating costs."[59] No comparable review or analysis was done to quantify the prevention benefits of reduced speed.

PHMSA should correct this cost-benefit imbalance by quantifying and adding the prevention benefits from reduced speed to its analysis. Accounting for the accident prevention benefits of reduced speed in its cost-benefit analysis may increase the net benefits of lower speed limits.

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[52] HHFT Proposed Rule, 79 Fed. Reg. at 45076.
[53] HHFT Proposed Rule, 79 Fed. Reg. at 45018.
[54] HHFT Proposed Rule, 79 Fed. Reg. at 45046.
[55] *Id*.
[56] RIA at 17 (quoting Athaphon Kawprasert and Christopher P.L. Barkan, *Effect of Train Speed on Risk Analysis of Transporting Hazardous Materials by Rail*, TRANSPORTATION RESEARCH RECORD, No. 2159, 2010, pp. 59-68).
[57] HHFT Proposed Rule at 12.
[58] Liu, X., M.R. Saat and C.P.L. Barkan, *Analysis of Causes of Major Train Derailment and Their Effect on Accident Rates*, TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD, Vol. 2289 (2012), pp. 154-163; Robert T. Anderson and Christopher P.L. Barkan, *Derailment Probability Analyses and Modeling of Mainline Freight Trains*, Railroad Engineering Program Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign (2005) available at http://railtec.illinois.edu/CEE/pdf/Conference%20Proceedings/2005/Anderson%20and%20Barkan%202005.pdf ("More cars can be expected to derail with increases in train speed and residual train length.").
[59] RIA at 134.

PHMSA should fully account for countervailing risks in its analysis.

PHMSA should also fully account for countervailing risk in its analysis. Countervailing risks are adverse economic, health, safety, or environmental consequences that occur due to a rule and that are not already accounted for in the direct cost of the rule.[60] PHMSA should consider the effect of countervailing risks such as:

- Reduced speed limits increasing the amount of time that HHFTs spend in proximity to highly populated areas and environmentally-sensitive areas; and
- Increased tank car weight due to mandatory retrofits under design Options 1 and 2 increasing the risk of bridge failure (and therefore accidents), especially for bridges owned by non-Class I terminal railroads.[61]

Like other benefits and costs, an effort should be made to quantify and monetize countervailing risks.[62] Each of these countervailing risks involves some uncertainty; PHMSA should assess the sources of uncertainty and the way in which benefit and cost estimates may be affected under plausible assumptions.

In some cases, such as the risk of bridge failure, PHMSA and FRA should collect more information from the railroads (including non-Class I railroads) on bridge capacity limits, determine whether any bridges need to be upgraded, and analyze how much such upgrades will cost.

With respect to the interplay between speed limits and routing, PHMSA should develop models to quantify positive and negative effects under given scenarios. This may be done as part of its routing analysis guidance, as described in the following section.

III. PHMSA should provide more detailed guidance on how to perform routing analysis in order to maximize net benefits and reduce distributional effects.

The Proposed Rule would require rail carriers transporting Bakken crude oil or ethanol to perform a routing analysis that considers 27 enumerated safety and security risk factors. The routing analysis requirement is a logical measure in light of the risks to public safety posed by HHFTs. Yet, to ensure that railroads are appropriately conducting this routing analysis in a way that maximizes net benefits, PHMSA should provide guidance to the railroads on how to conduct this routing analysis to determine the safest, most secure routes for hazardous materials. PHMSA should also analyze any potential distributional effects from this routing regulation.

The Proposed Rule would apply routing requirements that are already mandatory for carriers of certain hazardous materials to any carriers of HHFTs. Title 49 C.F.R., Part 172, Subpart I, prescribes the requirements for the development and implementation of plans to address security risks related to the commercial transportation of hazardous materials.[63] The Proposed Rule would extend these requirements to HHFTs. Specifically, the rule would require rail carriers to annually analyze the safety and security risks for the transportation routes used to transport HHFTs; consider and weigh 27 risk factors to identify any routes that may reduce the risk posed by HHFTs; use this analysis to establish primary routes for HHFTs; and reassess these risks and routing

[60] CIRCULAR A-4.
[61] *See* RIA at 87.
[62] CIRCULAR A-4.
[63] 73 Fed. Reg. 72182-72194 (Nov. 26, 2008).

decisions on an annual basis.[64] It would also codify voluntary routing analysis for all HHFTS that has been in place in since July 2014, in response to NTSB recommendations. [65]

***PHMSA should provide guidance to the railroads on how to conduct routing analysis to determine the safest, most secure routes for hazardous materials*.**

PHMSA, working with the Department of Transportation and the FRA, should provide guidance on how to weigh the 27 enumerated factors that railroads must consider in conducting routing analysis. The relevant regulations list 27 factors, but provide no guidance on how railroads should conduct this analysis.[66] The relevant provision states, "The risk analysis to be performed may be quantitative, qualitative, or a combination of both. In addition to clearly identifying the hazardous material(s) and route(s) being analyzed, the analysis must provide a thorough description of the threats, identified vulnerabilities, and mitigation measures implemented to address identified vulnerabilities."[67]

The lack of specificity in this section leaves important cost-benefit decisions to the railroads, which may select routes that do not maximize net benefits. PHMSA acknowledges this in its Regulatory Impact Analysis, stating, "In practice, it is impossible to know how much weight rail carriers will give to safety when making routing decisions," and "in some cases one factor must be traded off against another."[68]

In the Regulatory Impact Analysis, PHMSA discusses the benefits of the Proposed Rule by referencing a definition of "risk" as the product of threat, vulnerability and consequence.[69] *Threat* is the probability of an adverse event, *vulnerability* is the probability that an adverse event will result in damage, and *consequence* is the expected damage for an adverse event that does cause damage.[70] PHMSA could use this framework to provide more guidance on the routing analysis required pursuant to Part 172.

First, the 27 enumerated "risk factors" combine factors that could increase accident *consequence*—such as proximity to population centers, sensitive environmental areas, and emergency response capabilities—with factors that could increase the *threat* of an accident (such as track grade and track curvature) and factors that could increase *vulnerability* (such as trip length and volume of material carried). Currently, the regulation conflates these three components of risk, and offers no guidance on how to properly weigh them. This leaves important cost-benefit and value judgment decisions to railroads, rather than PHMSA, which has the expertise and statutory mandate to protect public health and safety.[71]

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[64] HHFT Proposed Rule at 45072; RIA at 60.
[65] National Transportation Safety Board (NTSB), Safety Recommendation R-14-4 (Jan. 23, 2014), available at http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_4FAE2BA7842828A280658D106340980117610500/filename/NTSB%20R-14-4%20to%20-6%20(1-23-14).pdf.
[66] 49 C.F.R. PART 172, Appendix D —Rail Risk Analysis Factors; *see also* 49 C.F.R. § 172.820 - Additional planning requirements for transportation by rail.
[67] 49 C.F.R. PART 172, Appendix D.
[68] RIA at 70.
[69] RIA at 20 (citing RAND Center for Terrorism Risk Management Policy, 2005).
[70] *Id*.
[71] 49 U.S.C. § 5101 ("The purpose of this chapter is to protect against the risks to life, property, and the environment that are inherent in the transportation of hazardous material in intrastate, interstate, and foreign commerce."); *id*. § 5103(b) ("The Secretary shall prescribe regulations for the safe transportation, including security, of hazardous material in intrastate, interstate, and foreign commerce").

Second, some of the 27 enumerated factors should likely be given more weight than others. PHMSA, working with FRA, should analyze accident data and determine which factors contribute most to accidents. It could then direct railroads to conduct an analysis that properly weighs each of the factors. A growing body of literature assesses train accident risk factors; PHMSA and FRA should use the best available data to inform this routing analysis.[72] This guidance should be continuously updated to improve the routing analysis based on updated information.

Finally, this provision could be amended to direct railroads to perform quantitative analysis whenever the benefits of doing so outweigh the costs of performing the analysis. PHMSA could propose the use of analytical models that assign numerical values to each of these 27 factors, based on their relative importance. Applying a principle from the OMB Circular, "where all benefits and costs can be quantified and expressed in monetary units, benefit-cost analysis provides decision makers with a clear indication of the most efficient alternative, that is, the alternative that generates the largest net benefits to society (ignoring distributional effects)."[73] An accurate numerical model could provide useful information to decision makers and the public about relative risks and benefits.

***PHMSA should assess any distributional effects caused by routing analysis and train rerouting*.**

Regulations that maximize social welfare may impose disproportionate costs on a particular subpopulation, resulting in both equity and efficiency problems. Recognizing this, Executive Order 12,866 permits agencies to consider "distributive impacts" and "equity" in promulgating rules,[74] and Executive Order 13,563 reiterated this point.[75] The Office of Information and Regulatory Affairs (OIRA) has also emphasized the importance of considering distributional effects in several guidance documents, including Circular A-4,[76] "Updated Principles on Risk Analysis," and "Cumulative Effects of Regulations."[77]

Because routing decisions involve judgment calls and tradeoffs between moving trains on certain areas of track versus others, some cities, towns and regions will experience more train traffic as a result of train re-routing, even if such routes pose the lowest overall risk to society. As a result, these areas will bear more relative risk, and may experience secondary effects, such as increased air and noise pollution or reduced residential property values near freight rail corridors.[78]

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[72] *See, e.g.*, Liu, X., M.R. Saat and C.P.L. Barkan, "Integrated Risk Reduction Framework to Improve Railway Hazardous Materials Transportation Safety," *Journal of Hazardous Materials*, Vol. 260 (2013), pp. 131-140; Liu, X., M.R. Saat and C.P.L. Barkan, "Analysis of Causes of Major Train Derailment and Their Effect on Accident Rates," *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2289 (2012), pp. 154-163.

[73] CIRCULAR A-4.

[74] Exec. Order No. 12,866 § 1(a), (b)(5), 58 Fed. Reg. 51,735 (1993).

[75] Exec. Order No. 13,563 § 1(c), 76 Fed. Reg. 3821 (2011).

[76] CIRCULAR A-4, at 14 (instructing agencies to "provide a separate description of distributional effects").

[77] Memorandum from Office of Information and Regulatory Affairs Administrator Cass Sunstein for the Heads of the Executive Departments and Agencies on Cumulative Effects of Regulations (March 20, 2012).

[78] *See, e.g.*, Michael Futch, *Examining the Spatial Distribution of Externalities: Freight Rail Traffic and Home Values in Los Angeles* Robert, UC San Diego (Nov. 11, 2011), available at http://www.coaltrainfacts.org/docs/Freight-Rail-Traffic-and-Home-Values-in-LA.pdf (finding an increase in rail traffic by 10 million gross ton miles per mile causes a 0.7 percentage point lower growth in home values within a 1/3 mile band around the tracks); A. Simons & Abdellaziz El Jaouhari, *The Effect of Freight Railroad Tracks and Train Activity on Residential Property Values*, APPRAISAL JOURNAL (Summer 2004) available at http://www.cityofpaloalto.org/civicax/filebank/documents/24571 (finding an average loss in value between

PHMSA should evaluate any distributional impacts from routing analysis and rerouting that may be caused by this new regulation. Distributional concerns could potentially act as "tiebreakers" between route alternatives that have the same aggregate net benefits.[79] PHMSA, working with FRA, should provide more guidance to railroads on how to conduct the routing analysis, to ensure maximum net societal benefits.

IV. DOT should collaborate with states to secure compliance with federal regulations.

States play an important role in enforcing federal rail safety regulations, conducting surveillance and inspections, and leading local emergency response efforts.[80] Recent accidents have demonstrated the need for additional communication between railroads and emergency responders to ensure that emergency responders are aware of train movements carrying large quantities of crude oil through their communities.

The Proposed Rule would add a new paragraph to the Hazardous Materials Regulations at 49 C.F.R. Section 174.310 that would formalize the recent emergency order requiring railroads to notify State Emergency Response Committees ("SERCSs") of trains carrying 1 million gallons or more of Bakken crude oil.[81] The Proposed Rule requests comment on whether railroads should be required to give SERCs notice at the 1 million gallon threshold, or some other amount of Bakken crude oil.

Rather than apply the 1 million gallon threshold, using the standard HHFT definition for notice to SERCs would provide clarity and consistency, as the majority of recent regulations and emergency orders have been based on the 20-car crude oil threshold.[82] Twenty carloads of Bakken crude oil or ethanol (the HHFT definition) amount to approximately 700,000 gallons. Requiring SERC notification for any train carrying 20 carloads or more of a Class 3 flammable liquid may also help states monitor and enforce compliance with the new tank car standards, speed limits, and classification requirements as set forth in this Proposed Rule. The required notification should include routing information, a description of the amount and characteristics of the crude oil or ethanol, applicable emergency response information, and contact information.

In addition, the Department of Transportation should work with state safety agencies to establish best practices for enforcing compliance with new regulations. Currently, some states, like California, have many inspectors who enforce federal and state rules pursuant to delegated authority. Other states have no inspectors. The Department of Transportation should consider disparate state resources and experience, as well as current and anticipated routing patterns, and provide training and guidance to state officials as necessary. Emergency response training is particularly important, as state and local officials are most often the first responders on the scene of an accident.

$3,800 and $5,800 (5%-7%) for houses in Ohio under 1,250 square feet located within 750 feet from a railroad track).

[79] *See* Cass Sunstein, *The Arithmetic of Arsenic*, 90 GEO. L.J. 2255, 2260 (2002).

[80] *See* 49 C.F.R. Part 212 ("State Safety Participation").

[81] Department of Transportation, Emergency Restriction/Prohibition Order, Docket No. DOT–OST–2014–0067 (May 7, 2014), available at http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_D9E224C13963CAF0AE4F15A8B3C4465BAEAF0100/filename/Final_EO_on_Transport_of_Bakken_Crude_Oi_05_07_2014.pdf.

[82] *See, e.g*. FRA Emergency Order 28, 78 Fed. Reg. 48218 (2013); AAR Circular No. OT-55-N (2013).

V. PHMSA should collect more accurate data on accident causes and damages and continuously improve safety standards.

The Department of Transportation's analysis reveals a systemic weakness in the way that it collects data on derailments of crude oil and ethanol trains. The analysis observes that "due to limitations in the reported data, it is impossible to isolate the derailment rate of only crude oil and ethanol trains."[83]

The Department of Transportation should collect more accurate data on accident causes and total damages, which it should use to improve risk-reduction strategies. Currently, PHMSA collects only some of this information, and "data verification is inconsistent."[84] Some accidents are reported only to FRA and not PHMSA, and misreporting is common.[85] PHMSA requires an incident report to be filed only if the incident led to the release of a hazardous material; derailments that did not result in a spill are not included.[86] FRA maintains data on all derailments, including hazardous material releases, but does not identify what type of substance was released. In short, neither agency has comprehensive data on derailments involving crude oil trains. Moreover, the data reported to PHMSA may be inaccurate, as it is self-reported by railroads. Such self-reports often underestimate the damages from spill incidents, as they may exclude evacuation of the public, disposal of contaminated soil, air quality and site monitoring and other costs.[87]

The Department of Transportation should require all accidents to be reported to one source, which can be accessed by FRA, PHMSA and NTSB. In addition, the Department should require rail carriers to report total damages that occur as a result of train accidents involving releases of hazardous material, including damages related to fatalities, injuries, property damage, environmental damage and clean-up costs, loss of business, and evacuation-related costs. This data should be reviewed and verified by the Department, with consequences for misreporting.

The agency should also require rail carriers to report every car carrying crude oil or hazardous material that derails, whether that car loses product or not. Such reporting would assist the Department in assessing the effectiveness of different kinds of cars in containing the hazardous materials that they carry, as well as the risk factors involved in accidents. PHMSA, working with FRA and NTSB, should use this information to continuously improve its guidance and regulations.

Finally, the Department of Transportation should review railroad performance following implementation of these new rules, and revise them as necessary to improve public health and safety.

Respectfully submitted,

Jayni Foley Hein
Institute for Policy Integrity
NYU School of Law

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[83] RIA at 21.
[84] HHFT Proposed Rule, 79 Fed. Reg. at 45072.
[85] RIA at 18, 26, 27
[86] *See* 49 C.F.R §§ 171.15, 171.16.
[87] RIA at 30 ("PHMSA believes that response costs and basic cleanup costs, when they are reported, do not represent the full costs of an accident or the response. . . . While it is incumbent upon the person who reports a hazardous materials incident to supplement their initial report, this most often does not happen unless PHMSA follows up with the filer").