U.S. Department of Transportation

Pipeline and Hazardous Materials

Safety Administration

Washington, D.C. 20590

Final Regulatory Impact Analysis

Hazardous Materials: Oil Spill Response Plans and Information Sharing for High-Hazard Flammable Trains

Docket No.: PHMSA-2014-0105 (HM-251B)

Office of Hazardous Material Safety

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Revisions and Updates to the Preliminary Regulatory Impact Analysis (RIA)

Since developing the preliminary Regulatory Impact Analysis (RIA), the Pipeline and Hazardous Materials Safety Administration (PHMSA) has reviewed the public comments submitted to the Notice of Proposed Rulemaking (NPRM) and continued our research of issues related to the rulemaking and analysis of regulatory impacts. Table R1 provides an overview of the significant revisions and updates made to the preliminary RIA.

Table R1. Updates to the Preliminary RIA

Analytical Area	Effect of the Revision or Update	Basis and Source(s)	Further Explanation in the RIA
Oil spill size updated to incorporate subsequent incidents	Average spill size is smaller than that estimated at the NPRM stage.	Industry-reported data as recorded in OHMS incident database	Section 3, "Benefits"
Number of derailments updated to include subsequent years of data	Fewer derailments per year predicted	PHMSA and FRA incident databases.	Section 3, "Benefits"
Plan development and review costs	These costs are higher than the preliminary RIA	Public comment and additional research, including input from OSRP plan writers	Section 2, "Costs" and Appendix A
Spill response narratives	Additional qualitative input on relevant oil train derailments and responses	EPA, FRA, and PHMSA data; State input; external news sources; public comment	Section 3, "Benefits" and Appendix B

Executive Summary

PHMSA, in consultation with the Federal Railroad Administration (FRA), is issuing a final rule that expands the applicability of comprehensive oil spill response plans (OSRPs) based on thresholds of crude oil that apply to an entire train consist.[1] Specifically, the final rule expands the applicability for OSRPs so that no person shall transport 20 or more loaded tank cars of liquid petroleum oil in a continuous block or a single train carrying 35 or more loaded tank cars of liquid petroleum oil throughout the train consist, unless that person has implemented a comprehensive OSRP. Furthermore, this action requires railroads to share additional information about high-hazard flammable trains (HHFT; defined as a train transporting 20 or more loaded tank cars of Class 3 flammable liquid in a continuous block or a single train carrying 35 or more loaded tank cars of Class 3 flammable liquid throughout the train consist) with State and Tribal Emergency Response Commissions (i.e., SERCs and TERCs) to increase community preparedness and incorporate the voluntary use of the initial boiling point test (ASTM D7900) to determine classification and packing group for Class 3 flammable liquids.[2]

Each railroad subject to the final rule is required to prepare and submit a comprehensive OSRP that includes a plan for responding, to the maximum extent practicable, to a worst-case discharge and to a substantial threat of such a discharge of oil. The OSRP must also be submitted to PHMSA, where it will be reviewed and approved by PHMSA personnel. PHMSA evaluated several alternatives for establishing the threshold values for the volume of petroleum being transported that would require a comprehensive response plan. These alternatives are discussed in greater detail in Section 1.5, "Alternatives Analysis."

Table ES 1 presents the annualized costs associated with the final rule by railroad class.[3]

Table ES 1. Overview of Estimated Costs (millions) (Undiscounted, 3%, 7%)

Class of Railroad	Undiscounted+		3% Discount Rate		7% Discount Rate	
	10-Year	Annualized	10-Year	Annualized	10-Year	Annualized
Oil Spill Response Plans						
Class I	$6.30	$0.6	$5.6	$0.7	$4.9	$0.7
Class II	$4.0	$0.4	$3.6	$0.4	$3.1	$0.4
Class III	$15.2	$1.5	$13.5	$1.6	$11.8	$1.7
Information Sharing						
All Railroads	$4.7	$0.5	$4.2	$0.5	$3.7	$0.5

[1] A train consist is considered the rolling stock, exclusive of the locomotive, making up a train.

[2] We note that the incorporation of ASTM D7900 test, which aligns with the API RP 3000, will not replace the currently authorized initial boiling point testing methods, but rather serve as a testing alternative if one chooses to use that method. PHMSA believes this provides flexibility and promotes enhanced safety in transport through accurate packing group assignment. This requirement will impose no new costs.

[3] "Class I railroad", "Class II railroad", and "Class III railroad" mean railroad carriers that have annual carrier operating revenues that meet the threshold amount for Class I carriers, Class II carriers, and Class III carriers, respectively, as determined by the Surface Transportation Board under section 1201.1–1 of title 49, Code of Federal Regulations." (49 U.S.C., subtitle V, part A, chapter 201, subchapter I, §20101(1).)

Cost to Government						
Government Costs	$2.1	$0.2	$1.9	$0.2	$1.7	$0.2
Total	$32.3	$3.2	$28.9	$3.4	$25.2	$3.6

+ Figures in this table may not match sums from table ES 3 exactly due to rounding error.

Table ES 2 provides a summary of the estimated per carrier cost associated with the final rule requirements, differentiated by cost category and class of railroad. For purposes of this analysis, PHMSA has identified several categories of costs related to the development and implementation of a comprehensive response plan. Those costs include: plan development, submission, and maintenance; contract fees for designating an oil spill response organization (OSRO); and training and exercises. We also identified costs to the Federal government for plan review and approval, which are discussed in Section 2.2.3.

Table ES 2. Undiscounted Unit Cost per Railroad by Railroad Class

Category	Outlay Period	Class of Railroad	Unit Cost Per Railroad
Plan Development	Year 1	Class I	$84,666*
		Class II	$28,222*
		Class III	$18,815*
Plan Maintenance	Annual	Class I	$8,745
		Class II	$2,915
		Class III	$1,943
Plan Submission	Once every 5 years	Class I	$21
		Class II	$21
		Class III	$21
OSRO Fee	Annual	Class I	$40,000
		Class II	$6,000
		Class III	$2,500
Training and Exercises	Year 1	Class I	$66,475**
		Class II	$42,305**
		Class III	$27,803**
Information Sharing	Year 1	All Railroads	$7,758
	Annual	All Railroads	$2,365

*This cost represents the plan development cost per railroad in the implementation year. The final rule requires each railroad to review its plan at least every 5 years from the date of the last approval. PHMSA estimates the recurring burden with reviewing the initial plan is half of the burden needed to develop the initial plan.

**This cost represents training and exercise costs in the implementation year (year 1). Subsequent years have different costs due to different frequencies applicable to the training/exercise requirements.

Table ES 3 below provides a summary of the undiscounted costs by year for this 10-year period by railroad class. Table ES 4 presents costs, benefits, and breakeven analysis by provision.

Table ES 3. Summary of Undiscounted 10-Year Costs by Railroad Class or Entity (millions)

Year	Oil Spill Response Plans			Information Sharing	Costs to Federal Government	Total
	Class I	Class II	Class III	All Railroads		
1	$1.4	$0.9	$2.8	$1.1	$0.6	$6.8
2	$0.5	$0.3	$1.2	$0.4	$0.2	$2.6
3	$0.5	$0.3	$1.2	$0.4	$0.2	$2.6
4	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
5	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
6	$1.1	$0.7	$2.3	$0.4	$0.2	$4.8
7	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
8	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
9	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
10	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6

Table ES 4. 10-Year and Annualized Costs, Benefits, and Breakeven % by Provision

Provision	Benefits (7%)		Costs (7%)
	Qualitative	Breakeven	
Oil Spill Response Planning	• Improved Communication/Defined Command Structure may improve response • Pre-identified Access to Equipment and Staging of Appropriate Equipment for Response Zones • Railroad employees and contractors trained to the OSRP	Cost-effective if this requirement reduces the consequences of spills by 6.7%.	10-Year: $21.4 million Annualized: $3.1 million
Information Sharing	• Improved Communication • Enhanced Preparedness	Cost-effective if this requirement reduces the consequences of spills by 1.2%.	10-Year: $3.7 million Annualized: $0.53 million
IBR of ASTM D7900	• Regulatory Flexibility • Enhanced Accuracy in Packing Group Assignments	--	No cost estimated
Total		Cost-effective if this requirement reduces the consequences of spills by 7.8%.	10-Year: **$25.2 million** Annualized: **$3.6 million**

OMB Circular A-4 Accounting Statement

Executive Orders 12866 and 13563 require agencies to regulate in the "most cost-effective manner," to make a "reasoned determination that the benefits of the intended regulation justify its costs," and to develop regulations that "impose the least burden on society."[4] PHMSA has determined that this rulemaking is a significant regulatory action under Executive Order 12866, Regulatory Planning and Review, and significant under U.S. Department of Transportation (DOT) regulatory policies and procedures because substantial public interest in this rulemaking exists.

Regulatory analyses are required to:[5]

1. Describe the need for the regulatory action.
2. Define the baseline.
3. Set the time horizon of analysis.
4. Identify a range of regulatory alternatives.
5. Identify the consequences of regulatory alternatives.
6. Quantify and monetize the benefits and costs.
7. Discount future benefits and costs.
8. Evaluate non-quantified and non-monetized benefits and costs.
9. Characterize uncertainty in benefits, costs, and net benefits.

This final regulatory impact analysis was prepared in accordance with the guidance provided by the Office of Management and Budget's (OMB) Circular A-4 on the development of regulatory analysis, as required under Section 6(a)(3)(c) of Executive Order 12866 and a variety of related authorities.

[4] (1993, October 4). Executive Order 12866. *Federal Register, 58*(190), 5173b–5174. https://www.reginfo.gov/public/jsp/Utilities/EO_Redirect.jsp. Executive Order 13563. *FR, 76*(14), 3821–3823. http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf.

[5] U.S. Office of Management and Budget. *Circular A-4,* https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/

Category	Impact	Source
Benefits		
Annualized monetized benefits ($ Million)	--	RIA
Annualized quantified, but unmonetized, benefits	--	RIA
Unquantifiable benefits	•Improved communication/defined command structure may improve response •Trained railroad employees and/or contract responders •Improved communication •Enhanced preparedness •Regulatory flexibility •Enhanced accuracy in packing group assignments	RIA
Costs		
Annualized monetized costs ($ Million)	$3.6 (7%)	RIA
	$3.4 (3%)	RIA
Annualized quantified, but unmonetized, costs	--	
Qualitative (un-quantified) costs	--	
Transfers		
Annualized monetized transfers: "on budget"	--	
From whom to whom?	--	
Annualized monetized transfers: "off-budget"	--	
From whom to whom?	--	
Other Analyses		
Effects on State, local, and/or tribal governments	--	
Effects on wages	--	
Effects on growth	--	

1. Introduction

1.1. Summary of the Final Rule

Summaries of and references to the final rule's requirements in this RIA are included for analytical purposes only. To understand the final rule's requirements, as codified by PHMSA in Title 49, Code of Federal Regulations (CFR), please review the regulatory text of the final rule.

The final rule expands the applicability of comprehensive OSRPs based on thresholds of crude oil that apply to an entire train consist. Specifically, the final rule expands the applicability for OSRPs so that no person shall transport a single train transporting 20 or more loaded tank cars of liquid petroleum oil in a continuous block or a single train carrying 35 or more loaded tank cars of liquid petroleum oil throughout the train consist unless that person has implemented a comprehensive OSRP.

This action also requires railroads to share additional information with SERCs and TERCs to increase community preparedness, and incorporate the voluntary use of the initial boiling point test (ASTM D7900) to determine classification and packing group for Class 3 flammable liquids.

1.1.1. Comprehensive OSRPs

Each railroad subject to the rule must prepare and submit a comprehensive OSRP that includes a plan for responding, to the maximum extent practicable, to a worst-case discharge and to a substantial threat of such a discharge of oil. The OSRP must be submitted to PHMSA, where it will be reviewed and approved by PHMSA personnel.

Each comprehensive OSRP must include:[6]

- *Core Plan:* A core plan includes an information summary and any components that do not change between response zones.[7] Each plan must:
    - Describe the railroad's response management system, including the functional areas of finance, logistics, operations, planning, and command.
    - Demonstrate that the railroad's response management system uses common terminology (e.g., the National Incident Management System) and has a manageable span of control, a clearly defined chain of command, and trained personnel to fill each position.
    - Include an information summary as required by § 130.120.

[6] The following text is provided as an overview of the rule and does not replace regulatory text included in the final rule.

[7] A response zone means a geographic area along applicable rail route(s), containing one or more adjacent route segments for which the railroad is required to plan for the deployment of, and provide spill response capabilities meeting the planning requirements of § 130.130.

- Certify that the railroad reviewed the National Contingency Plan (NCP)[8] and each applicable Area Contingency Plan (ACP)[9] and that its response plan is consistent with the NCP and each applicable ACP, as required by §§ 130.110 and 130.115.
- Include notification procedures and a list of contacts as required in § 130.125.
- Include spill detection and mitigation procedures as required in § 130.130.
- Include response activities and resources as required in § 130.130.
- Certify that applicable employees were trained per § 130.135.
- Describe procedures to ensure equipment testing and a description of the exercise program per § 130.140.
- Describe plan review and update procedures per § 130.145.
- Submit the plan as required by § 130.150.

- *Response Zone Appendix:* For each response zone, a railroad must include a response zone appendix to provide the information summary and any additional components of the plan specific to the response zones. For example, each response zone appendix must provide:
  - A description of the response zone, including county(s) and State(s).
  - A list of route sections contained in the response zone, identified by railroad milepost or other identifier.
  - Identification of environmentally sensitive areas.
  - Identification of the location where the response organization will deploy from and the location and description of equipment required.

Regarding NCP and ACP compliance, PHMSA believes that this requirement will provide a formal communication framework that currently may not be in place or may be informal. At a minimum, for consistency with the NCP, a comprehensive response plan must:

- Demonstrate a railroad's clear understanding of the Incident Command System and Unified Command;
- Include procedures to immediately notify the National Response Center; and
- Establish provisions to ensure the protection of safety at the response site.

At a minimum, for consistency with the applicable ACP (or Regional Contingency Plan (RCP) for areas lacking an ACP), the comprehensive response plan must:

[8] The NCP is the federal government's blueprint for responding to hazardous substance releases, as well as oil spills. See also https://www.epa.gov/emergency-response/national-oil-and-hazardous-substances-pollution-contingency-plan-ncp-overview

[9] ACPs are developed to address the specific geographic scope of the incident. Such plans enable responders to address incidents by helping to identify and coordinate the activities of the different government agencies and private organizations involved in the response in that geographic area. See also https://www.epa.gov/oil-spills-prevention-and-preparedness-regulations/area-contingency-planning

- Address the removal of a worst-case discharge, and the mitigation or prevention of the substantial threat of a worst-case discharge, of oil;
- Identify environmentally sensitive or significant areas, along the route, which could be adversely affected by a worst-case discharge;
- Describe the responsibilities of the persons involved and of Federal, state, and local agencies in removing a discharge and in mitigating or preventing a substantial threat of a discharge; and
- Identify the procedures to obtain any required federal and state authorization for using alternative response strategies, such as in-situ burning and/or chemical agents.

PHMSA believes NCP and ACP compliance will provide the added benefit of a formal response framework, and communication of command structures as well as the location of environmentally sensitive or significant areas.

In addition, the final rule would require plan holders to certify that they have identified and ensured by contract or other means the response resources which are available to arrive onsite within 12 hours after the discovery of a worst-case discharge or the substantial threat of such a discharge.

1.1.1.1. Pre-existing Oil Spill Response Requirements

The Clean Water Act (CWA), as amended by the Oil Pollution Act of 1990 (OPA 90), directs the President, at section 1321(j)(1)(C), to issue regulations "establishing procedures, methods, and equipment and other requirements for equipment to prevent discharges of oil and hazardous substances from vessels and from onshore facilities and offshore facilities, and to contain such discharges."[10] The CWA directs the President to issue regulations requiring owners and operators of certain vessels and onshore and offshore oil facilities to develop, submit, update, and in some cases obtain approval of OSRPs. Executive Order 12777 delegated this responsibility to the Secretary of Transportation for certain transportation-related facilities, and the Secretary delegated this responsibility to DOT's Research and Special Programs Administration (RSPA), PHMSA's predecessor agency.[11]

On June 17, 1996, RSPA published a final rule at 49 CFR part 130 to carry out PHMSA's delegated authority under the CWA for motor carriers and railroads.[12] This rulemaking adopted general spill response planning and response plan implementation requirements intended to prevent and contain spills of oil during transportation.

Title 49 CFR part 130 requires a basic OSRP for oil shipments in a packaging having a capacity of 3,500 gallons or more, which requires the preparation of a written plan that (1) "sets forth the manner of response to discharges . . .," (2) "takes into account the maximum potential discharge of the contents from the packaging," (3) "identifies private personnel and equipment available to

[10] CWA § 311(j)(1)(C). See also 33 U.S.C. § 1321(j)(5); and CWA § (j)(5).
[11] Executive Order 12777. Implementation of Section 311 of the Federal Water Pollution Control Act of October 18, 1972, as amended, and the Oil Pollution Act of 1990. *Federal Register*, *56*(204), 54757—54770. Retrieved from https://www.gpo.gov/fdsys/pkg/FR-1991-10-22/pdf/FR-1991-10-22.pdf
[12] (1996, June 17). Oil Spill Prevention and Response Plans. *Federal Register, 61*(117), 30533–30543. Retrieved from http://www.gpo.gov/fdsys/pkg/FR-1996-06-17/pdf/96-14611.pdf

respond to a discharge," and (4) "identifies the appropriate persons and agencies (including their telephone numbers) to be contacted in regard to such a discharge and its handling, including the National Response Center."[13] The requirements for a basic response were issued as a prevention and containment rule pursuant to § 1321(j)(1)(C) of the CWA.

Beyond a basic plan, the 1996 RSPA rulemaking specified that a comprehensive OSRP is required for oil shipments in a package containing more than 42,000 gallons (1,000 barrels). Other requirements from that rule specified that a comprehensive plan must: (1) include everything required in the basic OSRP, (2) be consistent with the National Contingency Plan and Area Contingency Plans, (3) identify a qualified individual with authority to implement removal and facilitate communication between federal officials and spill response personnel, (4) identify and ensure by contract response equipment and personnel to remove a worst case discharge, (5) describe training equipment testing, and drills, and (6) be submitted to FRA.[14] The comprehensive OSRP addresses minimum requirements for a plan specified by 33 U.S.C. 1321(j)(5)(D). The 1996 final rule accepted nationwide, regional, or other generic plans meeting the requirements. The plan holder was not required to account for different response locations. Please note, this final rule requires submission to PHMSA—not FRA—for review and approval of comprehensive plans, in addition to changing the applicability and other comprehensive plan requirements.

1.1.1.2. Changes under the Final Rule (Basic vs. Comprehensive Plans)

Currently, most—if not all—of the rail community transporting oil, including crude oil transported as a hazardous material, is subject to the basic OSRP requirement of 49 CFR 130.31(a), since most—if not all—rail tank cars being used to transport crude oil have a capacity greater than 3,500 gallons. However, a comprehensive OSRP for shipment of oil is required only when the quantity of oil is greater than 42,000 gallons per tank car. Accordingly, the number of railroads required to have a comprehensive OSRP is much lower, or possibly nonexistent, because a very limited number of rail tank cars in use would be able to transport a volume of 42,000 gallons in a car.[15] This final rule expands the applicability of comprehensive OSRPs to railroads transporting a single train of 20 or more loaded tank cars of liquid petroleum oil in a continuous block or a single train carrying 35 or more loaded tank cars of liquid petroleum oil throughout the train consist. Railroads meeting this new applicability would need to develop, maintain, and implement a comprehensive plan as described in this final rule.

1.1.2. Information Sharing

On May 7, 2014, DOT issued an Emergency Restriction/Prohibition Order in Docket No. DOT-OST-2014-0067 (Order),[16] which required each railroad transporting 1 million gallons or more of Bakken crude oil in a single train in commerce within the U.S. to provide certain information in writing to the SERC for each state in which it operates such a train. Later that year, PHMSA

[13] 49 CFR 130.31(a)
[14] 49 CFR 130.31(b)
[15] The 2014 Association of American Railroads' (AAR) Universal Machine Language Equipment Register numbers showed five tank cars listed with a capacity equal to or greater than 42,000 gallons, and none of these cars were being used to transport oil or petroleum products.
[16] Available at: https://www.regulations.gov/document?D=DOT-OST-2014-0067-0001

proposed in HM-251 to codify and clarify the requirements of the Order in the Hazardous Materials Regulations (HMR), and requested public comment on the various facets of that proposal (79 FR 45015, Aug. 1, 2014). Unlike many other proposals in the August 1, 2014 NPRM, the proposed notification requirements were specific to a single train that contains 1 million gallons or more of UN1267, petroleum crude oil, Class 3, sourced from the Bakken shale. In the final rule, HM-251 (80 FR 26643, May 8, 2015), PHMSA did not adopt the separate notification requirements proposed in the HM-251 NPRM and instead relied on the expansion of the existing route analysis and consultation requirements of § 172.820 to include HHFTs.

On December 4, 2015, President Obama signed into law the Fixing America's Surface Transportation Act of 2015 ("FAST Act"). The FAST Act includes the "Hazardous Materials Transportation Safety Improvement Act of 2015" at Sections 7001 through 7311, which provides direction for PHMSA's hazardous materials safety program. Section 7302 directs the Secretary to issue regulations that require Class I railroads to provide State Emergency Response Commissions (SERCs) advanced notification of HHFTs traveling through their respective jurisdictions. Section 7302 requires Class I railroads to provide advanced notification and information on HHFTs to SERCs consistent with the notification requirements in the Secretary's May 2014 Emergency Order in docket number DOT-OST-2014-0067. Section 7302 further requires SERCs receiving this advanced notification to provide the information to law enforcement and emergency response agencies upon request and directs the Secretary to establish security and confidentiality protections for the electronic train consist information and advanced notification information required by Section 7302.

In response to the FAST Act and to the public interest and feedback the Department previously received related to its May 7, 2014 Emergency Order, this final rule adds a new section, 49 CFR 174.312, with information sharing requirements. As directed by the FAST Act, the information requirements are generally consistent with the Order, but broaden the scope of trains covered by the requirement. Consistent with the FAST Act, the regulation expands the notification requirement to apply to all HHFTs, as defined in the HHFT final rule, not just trains transporting 1 million or more gallons of Bakken crude oil, and requires railroads to provide updates to the notification for changes in volume greater than 25 percent. In addition, it would require railroads to provide the required information to both SERCs and Tribal Emergency Response Commissions (TERCs), or other appropriate state-delegated agencies. Finally, a railroad operating a train subject to the Comprehensive Oil Spill Response Plan requirements would also need to provide the relevant SERCs, TERCs, or other appropriate state or tribal agencies with the contact information for qualified individuals specified in the plan.

In addition, § 174.312 requires a rail carrier operating an HHFT to provide on-going notifications to each SERC, TERC, or other appropriate state-delegated entities meeting the following requirements:

- A reasonable estimate of the number of HHFTs that the railroad expects to operate each week, through each county within the State or through each tribal jurisdiction;
- The routes over which the HHFTs will operate;
- A description of the hazardous material being transported and all applicable emergency response information required by subparts C and G of part 172 of the HMR;

- HHFT point of contact: at least one point of contact at the railroad (including name, title, phone number, and address) related to the railroad's transportation of affected trains;
- If a route is additionally subject to the comprehensive spill plan requirements, the notification must include a description of the response zones (including counties and states) and contact information for the qualified individual and alternate;
- Railroads must update the notifications for changes in volume greater than 25 percent.
- Notifications and updates may be transmitted electronically or by hard copy;
- If the disclosure includes information that railroads believe is security sensitive or proprietary and exempt from public disclosure, the railroads should indicate that in the notification.
- Each point of contact must be clearly identified by name or title and role (e.g., qualified individual, HHFT point of contact) in association with the telephone number. One point of contact may fulfill multiple roles; and
- Copies of HHFT notifications made must be made available to the Department of Transportation upon request.

1.1.3. Boiling Point

The initial boiling point (IBP) test (ASTM D7900) is not currently aligned with the testing requirements authorized in the HMR, forcing shippers to continue to use the testing methods authorized in § 173.121(a)(2). This misalignment results in a situation in which an industry best practice for testing of crude oil (ASTM D7900 for initial boiling point) that was developed in concert with PHMSA is not authorized by the HMR. Therefore, for initial boiling point determination, PHMSA is proposing to incorporate by reference the ASTM D7900 test method identified within American Petroleum Institute Recommended Practice (API RP) 3000, thus permitting an industry best practice for testing Class 3 Packing Group (PG) assignments.

The API RP 3000 provides guidance on the material characterization, transport classification, and quantity measurement for overfill prevention of petroleum crude oil for the loading of rail tank cars. With regard to classification, this recommended practice concluded that for crude oil containing any significant amount of light end components (e.g., methanes, ethane, propane, butane and iso-butane), the recommended best practice is to test using American Society for Testing and Materials (ASTM) D7900. The ASTM D7900 differs from the boiling point tests currently in the HMR, because it is the only test which ensures a minimal loss of light ends. PHMSA notes that the incorporation of ASTM D7900, which aligns with the API RP 3000, will not replace the currently authorized testing methods, but rather will serve as a testing alternative if one chooses to use that method. PHMSA believes that this provides flexibility and promotes enhanced safety in transport through accurate PG assignment. This provision is voluntary and would not impose any costs to industry.

1.2. Determination of Need

1.2.1 Background

PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives. To do this, PHMSA establishes national policy, sets and enforces standards, educates stakeholders and the public, conducts research to prevent accidents, and prepares the public and first responders to reduce the consequences if accidents do occur.

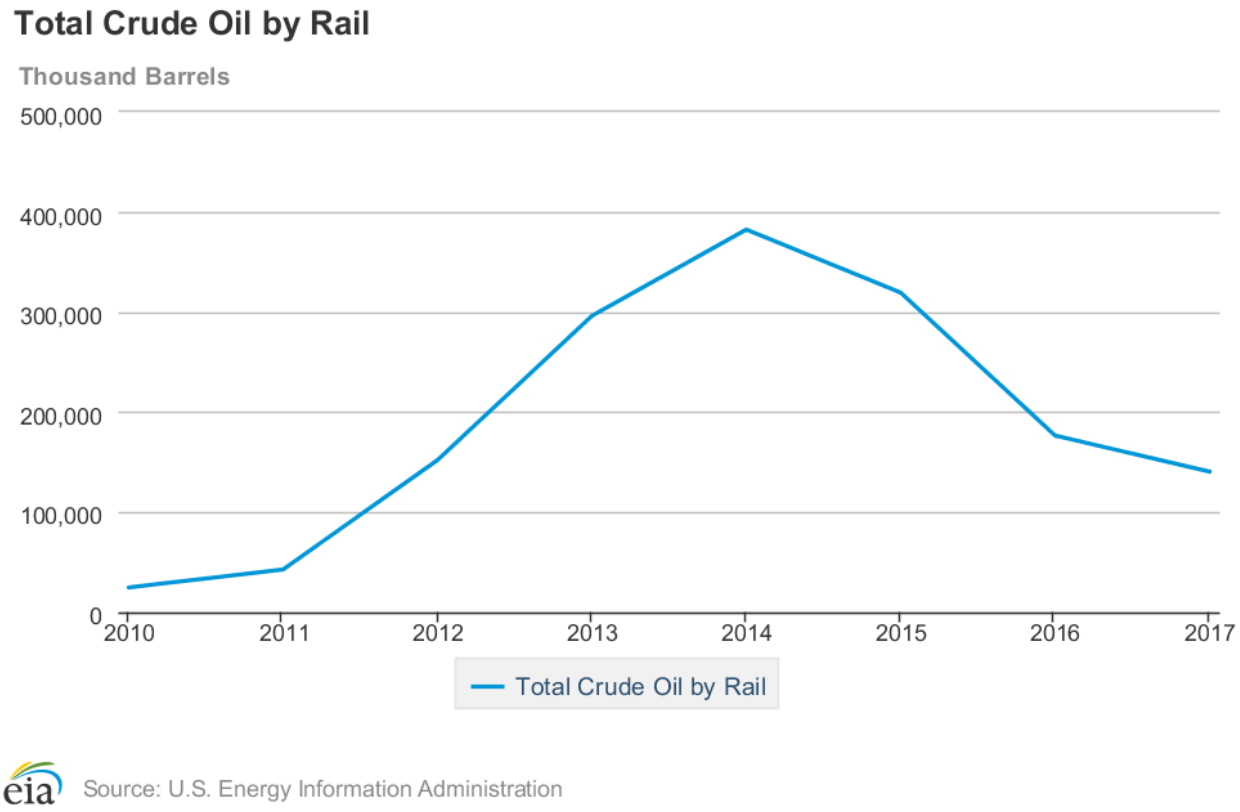
The United States is now a global leader in crude oil production. U.S. Energy Information Administration (EIA) projects that U.S. crude oil production will surpass the 9.6 million barrels per day (b/d) record set in 1970 and plateau between 11.5 million b/d and 11.9 million b/d[17], representing a total growth between 20 percent and 24 percent increase until 2040, or 0.7 percent to 0.8 average annual growth. Thus, the final rule is necessary due to the expansion in U.S. energy production, which has led to significant challenges in the transportation system. Expansion in oil production has led to increasing volumes of product transported to refineries and other transport-related facilities, such as transloading facilities. With a growing domestic supply, rail transportation remains a flexible alternative to transportation by pipeline or vessel. While annual crude-by-rail volumes have fallen from their peak in 2014 (382,034 thousand barrels), they were 175,701 thousand barrels in 2016 and 139,805 thousand barrels in 2017 as opposed to 23,788 thousand barrels in 2010 and 42,370 thousand barrels in 2011, or a nearly fivefold (487 percent) increase from 2010 to 2017.[18] In 2018 through July, EIA reported a 10 percent increase in volumes of crude by rail estimates over 2017.

[17] U.S. EIA. Energy production (Reference case), pp. 19-20. Available at: https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf

[18] U.S. EIA. Total Crude by Rail. Available at: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=esm_epc0_rail_zamn-zamn_mbbl&f=a

Figure 1 provides annual U.S. rail movements of crude oil from 2010 to 2017.

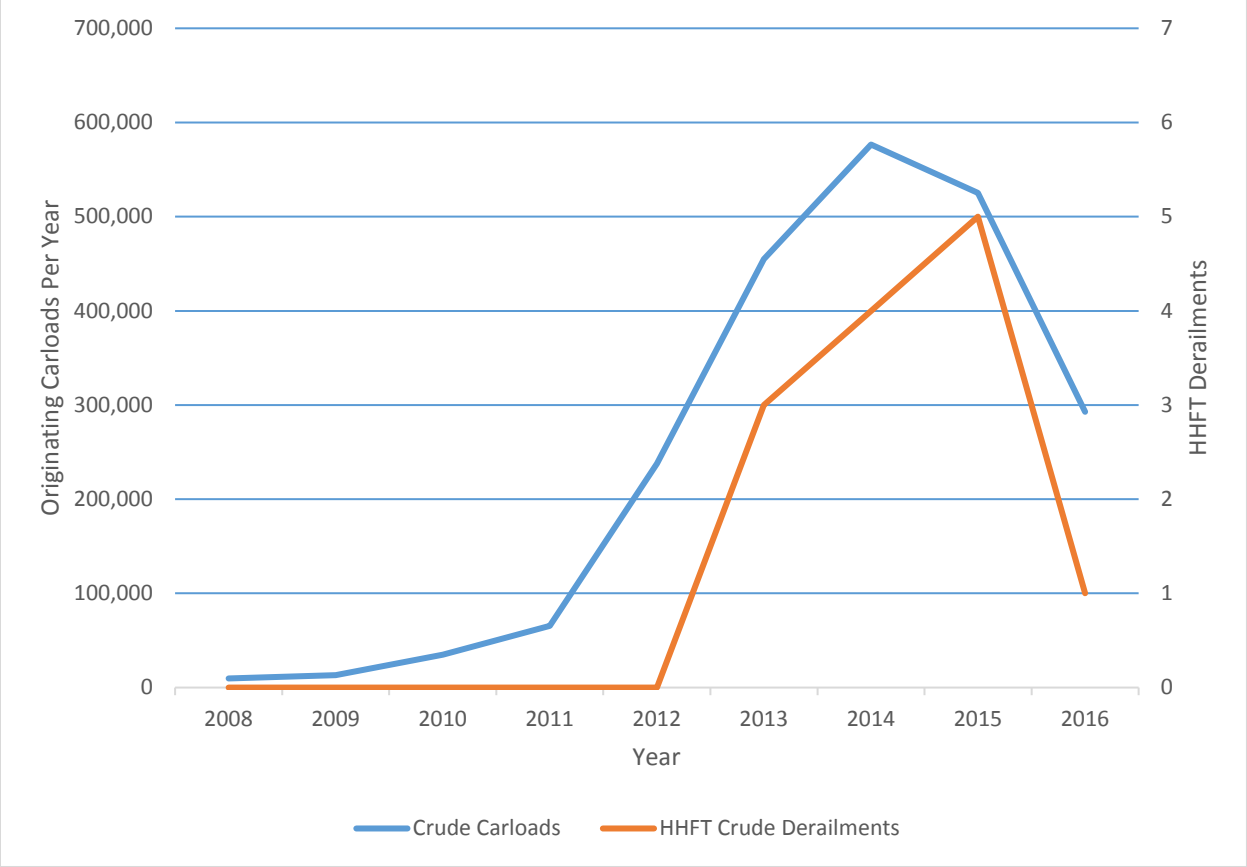
Figure 1. Annual Rail Movements of Crude Oil by Rail[19]



[19] This data is for the lower 48 states only. See https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=ESM_EPC0_RAIL_ZAMN-ZAMN_MBBL&f=M

Rail accidents have tracked changes in rail shipments of crude oil—rising when rail shipments increase in volume and falling when crude oil volumes fall. Figure 2 shows this rise in carloads and derailments in recent years.[20]

Figure 2. Carloads of Crude Oil Shipped and Derailments, 2008–2016



Sources and notes: Vertical Axes present data on different scales. Originating Class I Carloads for 2008–2016 obtained from the Surface Transportation Board Waybill sample. Derailments are from the PHMSA and FRA Incident Report databases.

Based on these train accidents, the expectation of continued domestic crude oil production and transportation, and the number of train accidents involving crude oil, PHMSA maintains that improved oil spill response planning is essential to protecting people and the environment from the risks of derailments involving large quantities of petroleum oil.

PHMSA has identified several recent derailments to illustrate the circumstances and consequences of derailments involving petroleum oil transported in higher-risk train configurations: Plainfield, IL (June 2017); Money, MS (April 2017); Mosier, OR (June 2016); Watertown, WI (November 2015); Culbertson, MT (July 2015); Heimdal, ND (May 2015); Galena, IL (March 2015); Mt. Carbon, WV (February 2015); La Salle, CO (May 2014); Lynchburg, VA (April 2014); Vandergrift, PA (February 2014); New Augusta, MS (January 2014); Casselton, ND (December 2013); Aliceville, AL (November 2013); and Parkers Prairie, MN (March 2013). The Heimdal,

[20] Surface Transportation Board Waybill Sample and PHMSA Incident Report Database

ND derailment and prior derailments were discussed in the NPRM and preliminary RIA. For information on these derailments, please see the NPRM, preliminary RIA, and associated regulatory docket (PHMSA-2014-0105). We discuss more recent derailments in this final RIA, see Appendix B.

Separate from derailments occurring in the United States, PHMSA also considered the July 2013 derailment in Lac-Mégantic, Quebec. In response to this derailment, the NTSB issued Safety Recommendation R-14-5, which recommended that PHMSA revise the spill response planning thresholds prescribed in 49 CFR part 130 to require comprehensive OSRPs to effectively provide for the carriers' ability to respond to worst-case discharges resulting from accidents involving unit trains or blocks of tank cars transporting petroleum products.[21] Thus, the revisions included in this final rule were developed in response to this NTSB recommendation, as well as recent derailments.

1.2.2 Market Failure

With respect to the role of insurance and liability in internalizing costs of oil spills, a market failure at issue is that the shippers and rail companies are not insured against the full liability of the consequences of incidents involving hazardous materials, including oil. Even with adequate insurance, it is unclear whether full compensation for the consequences of events that may result in severe injury or death is possible, resulting in external costs that go unrecompensed regardless of the insurance carried by the railroad. Incidents involving severe negligence on the part of the carrier may therefore result in harm that goes uncompensated. In addition, in the case of a catastrophic event, a railroad company may become insolvent due to oil spill liabilities exceeding its available capital and ability to pay. Despite potentially being a responsible party, the railroad could "escape liability" in this way and costs would become social externalities. Additionally, to process a claim to insurance compensation, those harmed must demonstrate real harm and value lost. In the case of damage to the environment, the actual monetary value of lost or damaged assets is difficult to determine. Relatedly, high information and coordination costs may pose a barrier to aggregating claims of harm because the harm done to any affected entities may be lower than the cost of obtaining evidence of harm, even though they may be substantial in the aggregate. As a result, derailments involving petroleum oil may impose externalities or negative consequences. Although the Agency does not believe that OSRPs would prevent or reduce the probability of a derailment that may result in release of crude oil into the environment, such planning and preparation can result in a more effective response after an oil spill occurs, and hence mitigate or reduce the negative consequences.

As further evidence of potential market failure, PHMSA notes the typical limits of insurance coverage for rail liabilities. In the RIA for the HM-251 rulemaking and PHMSA's Rail Liability Study, we indicated that, among Class I railroads, a self-insured retention of $25 million is common, though it can be as much as $50 million, especially when toxic if inhaled (TIH) material

[21] National Transportation Safety Board. (2014, January 21). *Safety Recommendation R-14-4 through -6.* Retrieved from http://www.ntsb.gov/safety/safety-recs/recletters/R-14-004-006.pdf.

is involved.[22] On the other hand, smaller regional and short line carriers, such as Class II and Class III railroads, typically maintain retention levels well below $25 million, as they usually do not have the cash flow to support substantial self-insurance levels.[23] Further, the maximum coverage available in the commercial rail insurance market appears to be in the range of $1–1.5 billion per carrier, per incident.[24]

While this level of insurance may be sufficient for the vast majority of accidents, it is inadequate to cover some higher-consequence events. For example, the rail carrier responsible for the incident at Lac-Mégantic, Quebec in July 2013 was covered for a maximum of $25 million in insurance liability and had to declare bankruptcy because that coverage and the company's remaining capital combined were insufficient to pay for more than a fraction of the harm that was caused. Therefore, rail carriers and shippers had insufficient coverage to bear the entire cost of "making whole" those affected when an incident involving crude and ethanol shipment by rail occurred. Further, some damages are unlikely to lead to liability, including any damages to the American public's non-use values of an area where a release occurs, as well as small amounts of per capita damages that can be large overall if they affect a large number of people. For instance, if a release causes an evacuation, the affected groups may not suffer enough harm to overcome the fixed costs of litigating that harm, and coordination among the people affected may be difficult.

Another issue is that shippers, though responsible for buying or leasing the tank cars in which these products are shipped and loading the material into the tank cars, do not generally bear any liability for an incident once a rail carrier has accepted shipment, and rail carriers cannot refuse shipments because of their common carrier obligation.[25] In addition, the rates that rail carriers can charge to move these commodities are generally negotiated between the shipper and the carrier on a contract basis and regulated by the Surface Transportation Board. Shippers do not generally bear liability for their shipments while in transport and thus may lack an appropriate full incentive to ensure that the tanks cars are adequate to appropriately address the level of risk.

The FAST Act required DOT to initiate a study on the levels and structure of insurance for railroad carriers transporting hazardous materials, and submit a report to Congress on the results of the study and recommendations for addressing liability issues with rail transportation of hazardous materials. This report was completed and transmitted to Congress in November 2017. It is also available at PHMSA's website.[26]

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[22] Pipeline and Hazardous Materials Safety Administration (PHMSA), "Hazardous Materials by Rail Liability Study: Report to Congress," November 29, 2017, available at: https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/news/57011/report-congress-hazardous-materials-rail-liability-study-nov-2017_1.pdf [hereinafter Rail Liability Study]

[23] http://www.dot.gov/office-policy/transportation-hazardous-materials-insurance-security-and-safety-costs (section 3.4 Rail Liability and Insurance Controversy).

[24] Rail Liability Study, pg. 31

[25] See 49 U.S.C. § 11101. Available at: https://www.law.cornell.edu/uscode/text/49/11101

[26] Rail Liability Study, available at: https://www.phmsa.dot.gov/news/hazardous-materials-rail-liability-study

1.3. Baseline Analysis

This section details the regulatory baseline as well as the planning and response baseline related to oil spill response planning. The table below provides a high-level summary of the anticipated changes to baseline conditions if this rule were to become effective.

Table 1. Baseline Analysis of Regulatory Provisions

Provision	No Action Baseline	Final Rule	Potential Change between the Baseline and Final Rule
Oil Spill Response Plans (OSRPs)	• Railroads transporting 3,500 gallons of oil in a tank car must meet the requirements for "basic" plans as set forth by 49 CFR part 130 • Based on current operating procedures, railroads are not required to meet the requirements for "comprehensive" plans set forth by 49 CFR part 130 and thus plans are not aligned with OPA 90 and 33 U.S.C. 1321 (j)(5)(D) • Current plans lack alignment with the larger Federal oil spill regulatory regime (e.g., USCG, BSEE, and EPA) • Railroads currently plan for derailments involving petroleum oil through voluntary internal planning, use of basic plans under part 130, and non-regulatory cooperation with OSROs and non-OSRO contractors • The current response inventory available to railroads suggests that OSRO resources are available to arrive on site within 12 hours and to respond to a WCD[27]	• No change to basic plan requirements under part 130 • Railroads transporting HHFT of liquid petroleum oil need to develop a comprehensive plan in accordance with part 130 • Railroads' comprehensive plans will align with OPA 90 and 33 U.S.C. 1321 (j)(5)(D) • Railroad's comprehensive plans will be more aligned with plans used in other industries and overseen by other Federal agencies • Railroads will determine and include in their plan a WCD planning volume for each response zone based on their operations and the final rule definition • Railroads will be required to certify response resources are available to respond to a WCD by contract or other means • Railroads will implement a training program consistent with or equivalent to PREP guidelines • Railroads will submit comprehensive plans and updates to FRA for approval • The quantity and type of response resources available for response to a WCD will be cited in the comprehensive plan or will meet OSRO classification standards	• 73 railroads will develop, maintain, and submit to PHMSA a comprehensive plan meeting the requirements. This includes a requirement that railroads ensure by contract or other means necessary response resources to respond to a WCD.[28] Further, this requires railroads to conduct training, exercises, and drills in accordance with their comprehensive plan and PREP guidelines • The chain of events in a response are anticipated to be better coordinated and communicated, potentially quicker, and better integrated into the Federal oil spill response regulatory regime • Responses to derailments involving petroleum oil will implement comprehensive plans, reducing damages resulting from oil spills

[27] Based on PHMSA's analysis of available OSROs found in the USCG OSRO Response Resources Inventory System and publicly-available Office of Pipeline Safety pipeline operator OSRPs. See the discussion in this "Baseline Analysis" section.

[28] Due to data uncertainty, PHMSA's analysis assumes railroads do not have contracts in place. Costs are estimated for all affected entities and do not account for the current level of compliance.

Provision	No Action Baseline	Final Rule	Potential Change between the Baseline and Final Rule
Information Sharing	• Railroads must notify SERCs and TERCs of expected movements of 1 million or more gallons of Bakken crude through the SERCs' respective jurisdictions • May 2014 DOT Emergency Order (E.O.) remains in full force and effect[29] • FAST Act instructs the Secretary to issue regulations that require each Class I railroad to provide SERCs with information consistent with the May 2014 DOT E.O.	• All railroads transporting HHFT must notify SERCs and TERCs or another appropriate state-delegated agency • Responds to FAST Act mandate by codifying requirements consistent with the DOT E.O.	• Notifications are required for flammable liquids in addition to Bakken crude oil (e.g., ethanol, crude oil sourced from other oil-producing regions) • Notifications are required for railroads transporting a HHFT, irrespective of the 1 million-gallon criteria from the DOT E.O. • PHMSA estimates that 7 Class I and 40 Class II and III railroads were covered by the DOT E.O., while an additional 131 railroads were not covered and will develop SERC notifications under the rule.
IBR of ASTM D7900	• Shippers use the testing methods authorized in § 173.121(a)(2) of the HMR • The initial boiling point (IBP) test and practice recommended by industry is ASTM D7900, within API RP 3000, and cannot be used for compliance with the HMR	• ASTM D7900 is incorporated into the HMR and serves as a testing alternative if a shipper chooses to use that method	• Shippers have options in conducting an initial boiling point test (regulatory flexibility) • Aligns with industry best practices • Use of ASTM D7900 is voluntary and would not impose any costs to industry

1.3.1. Current Regulatory Baseline

PHMSA views the regulatory baseline as the existing regulatory framework found in 49 CFR part 130, which provides the oil spill response requirements that PHMSA has already promulgated and currently oversees. These regulations would continue to be in effect in the absence of this rulemaking. Railroads transporting petroleum oil in tank cars that exceed 3,500-gallon capacity are currently required to have a "written basic plan" ("basic plan") meeting the response planning requirements set forth for basic plans in 49 CFR 130.31(a). Based on this tank car threshold, PHMSA assumes all railroads transporting petroleum oil have a basic plan.

Currently, 49 CFR part 130 includes requirements for comprehensive plans. A comprehensive plan is required for railroads transporting petroleum oil in tank cars exceeding 42,000-gallon capacity. In practice, railroads transporting petroleum oil do not currently need to fulfill these comprehensive plan requirements because the tank cars used to transport petroleum oil are less than 42,000-gallon capacity, and thus are not applicable according to the scope of the part found in 49 CFR 130.2. The current 49 CFR part 130 requirements establish different regulatory standards for response planning based on the existing applicability of the part and the extent of the differences between the basic and comprehensive plan requirements. It is important to note that the current thresholds are based on size of a containment vessel and not the amount of material transported in a single train set or consist.

[29] https://www.phmsa.dot.gov/news/phmsa-notice-regarding-emergency-response-notifications-shipments-petroleum-crude-oil-rail-0

Basic plans do not meet all the statutory requirements for response plans under the Oil Pollution Act of 1990 found in 33 U.S.C. 1321(j)(5)(D)(i) through (vi), whereas the comprehensive plan requirements are written in parallel to these statutory requirements. In the final rule, PHMSA maintains that railroads transporting large quantities of petroleum oil in a single train set must meet the statutory requirements for a response plan as prescribed in 33 U.S.C. 1321(j)(5)(D)(i) through (vi) and the comprehensive plan requirements in 49 CFR part 130, which, according to commenter input, must also be amended for clarification and further alignment with statute. PHMSA also seeks to align 49 CFR part 130 with the interagency Federal regulatory framework and industry best practices pertinent to oil spill response planning. For additional explanation of the regulatory baseline, please refer to the "Background and Purpose" section of the final rule.

1.3.2. Current Planning and Response Baseline

The current regulations described in Section 1.3.1 of this RIA provide a minimum standard for regulatory compliance. Based on comments to the ANPRM, NPRM, anecdotal evidence, and additional research, PHMSA anticipates that many railroads are likely to meet the current basic plan requirements required under 49 CFR part 130 and many may exceed these minimum standards. Given current voluntary industry action with regard to oil spill response planning, this section anticipates the planning and response changes that might be imposed by this rule. As we anticipate that many railroads may voluntarily exceed the minimum standard for compliance, the change to the current planning and response baseline is likely to be less than the change in the regulatory baseline. To explore this possibility further, PHMSA analyzed the extent of the existing Oil Spill Removal Organization (OSRO) network to develop a better understanding of the existing coverage relative to potential derailment areas. This gives a better picture of the rule's potential impact on oil spill planning and response than the regulatory baseline.

We understand the OSRO network to be comprised of a variety of organizations that can provide response resources and respond to an oil spill in the event of a derailment involving petroleum oil. In this final rule, we define an OSRO as an entity that provides response resources. This definition would include U.S. Coast Guard (USCG)-certified Oil Spill Removal Organizations. PHMSA thus uses the acronym, OSRO, in a general sense as defined in the final rule, but also uses "USCG OSRO" or "USCG-certified OSRO" to refer to an organization that has voluntarily chosen to participate in the USCG's classification program and has met USCG standards to be classified as an OSRO.[30] USCG OSRO classification standards are found in Appendix B of 33 CFR part 154, for marine transportation-related facilities, and Appendix B of 33 CFR part 155, for vessels. In addition, USCG OSRO classification standards are discussed in the April 24, 2013 USCG Policy Letter.[31]

PHMSA notes that USCG has more than one classification standard for USCG OSROs. As such, the USCG classification is not a "one-size-fits-all" approach, but allows for flexibility depending on the applicable operating area as well as different tiers based on the quantity, type, and availability of response resources. The USCG-designated operating areas are: Rivers/Canals; Great Lakes; Inland: Nearshore; Offshore; and Open Ocean. These operating areas are defined in 33 CFR 154.1020. The different tiers that USCG designates are: Maximum Most Probable

[30] http://www.americansalvage.org/email-files/MER-Policy-Letter-03-13-OSRO-Classification_signed.pdf
[31] Ibid.

Discharge (MMPD); Worst Case Discharge (WCD) 1; WCD 2; and WCD 3. The different tiers correspond to different criteria for response resources, availability (response timeframes), and oil recovery capability.

PHMSA's Office of Pipeline Safety already uses the USCG OSRO classification standards and criteria as part of their evaluation and approval of pipeline operator OSRPs. As such, PHMSA's Office of Hazardous Materials Safety (OHMS) worked with OPS to learn about their practices and approval of pipeline operator plans. OPS referred OHMS to the USCG OSRO classification standard of "Rivers/Canals" at the tier of WCD 1 as the most applicable standard for pipelines.[32] PHMSA OHMS seeks to align our practices and regulation, whenever reasonable, with OPS. For evaluation of response resource availability and capability, the standard comprising Rivers/Canals and WCD 1 appears to be appropriate for railroads' comprehensive plans. OPS' use of USCG's Rivers/Canals OSRO standard lends support to the suitability of the USCG OSRO classification system for the rail context and demonstrates that the classification system is applicable to both water- and land-based spills. We note that there may be differences between pipeline and rail spill contexts, but the Rivers/Canals OSRO standard was recommended over the other standards for our analytical purposes (e.g., Inland: Nearshore).

USCG OSRO classification is important because, in USCG's program, the holder of an oil spill response plan can list an USCG OSRO in their plan rather than provide an extensive, detailed list of response resources. For the comprehensive plan requirements, PHMSA has allowed regulatory flexibility akin to the USCG program, such that a plan holder (railroad) citing a USCG-certified OSRO is not required to provide a detailed listing of equipment, supplies, and personnel within the comprehensive plan. PHMSA expects railroads affected by the final rule to primarily contract with USCG-certified OSROs and to utilize this regulatory flexibility. PHMSA anticipates that railroads may also contract with other (non-USCG-certified) OSROs to fulfill other, specific needs specified within their core plans or within a given response zone. We emphasize, however, that the final rule does not require a railroad to use a USCG-certified OSRO; the rule requires a standard for response planning and allows the plan holder/operator discretion and flexibility in determining the best way to meet that standard.

PHMSA also notes we have not required any specific regulation that would prevent the "sharing" of OSROs between railroads. Whether an OSRO services more than one railroad in an area, or within a response zone, is a private decision for the interested railroads to consider. However, it is our understanding that USCG classification guidelines distinguish between "dedicated" and "non-dedicated" resources. If resources are "non-dedicated," this may affect the availability of response resources and response times, and this could in turn affect the OSROs classification.[33]

In light of this discussion, PHMSA assumes for the purposes of this analysis that a railroad meeting the rule's applicability will contract with a USCG-certified OSRO to comply with the response

[32] PHMSA notes that the operating areas definitions can be specific and technical and the reader is advised to refer to them in 33 CFR 154.1020. The "Rivers/Canals" operating area is a subset of the "Inland" operating area. According to 33 CFR part 154, "Rivers and canals" means a body of water confined within the inland area, including the Intracoastal Waterways and other waterways artificially created for navigation, that has a project depth of 12 feet or less.

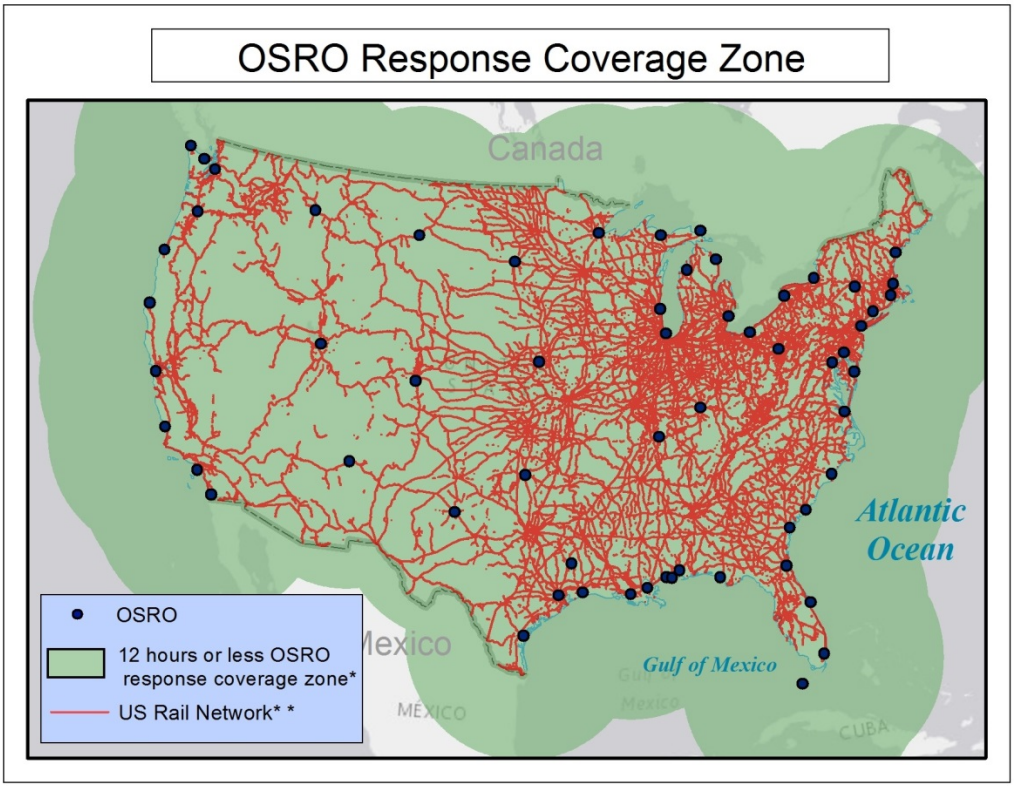
[33] http://www.americansalvage.org/email-files/MER-Policy-Letter-03-13-OSRO-Classification_signed.pdf

requirements of the final rule. USCG maintains a publicly-available registry of USCG-certified OSROs, known as the Response Resource Inventory System (RRIS). [34] Using the RRIS and publicly-available OSRPs submitted to the Office of Pipeline Safety, PHMSA analyzed the network of USCG-certified OSROs alongside the rail network and thus the coverage of potential derailment areas that currently exists (and would likely be sustained in the absence of rulemaking).[35] These two publicly-available sources provided sufficient information to identify the name and location of existing, USCG-certified OSROs and to map the network of response coverage across the United States. PHMSA is aware that OSRO resources are mobilized from master service agreements and from locations across USCG zones. However, PHMSA has chosen to approximate the focal point of their coverage at the location given in the USCG OSRO RRIS because the locations of specific response equipment are not widely available.

Given the USCG-certified OSRO's location, we estimated the extent of the OSRO's response coverage by applying the assumption that the OSRO could travel to the site of a derailment at 35 miles per hour (mph). This assumption is consistent with the standards of the USCG OSRO classification guidelines and as such, it is also consistent with the standards applied in PHMSA's approval of pipeline operator OSRPs.[36] Therefore, for response resources traveling by land, the comprehensive OSRP will only be approved if all the necessary response resources are staged within 420 miles of any point in the response zone. This requirement is similar to existing Federal OSRP requirements under the USCG. To ensure response resources are adequately placed, USCG gauges whether response resources can make it to a given location by assuming response resources can travel 35 mph. We feel this 35 mph appropriately accounts for slower speeds due to impediments or traffic, since the actual mechanical ability of land vehicles would often be greater than 35 mph. We have incorporated this standard into the response planning requirements of this rule.

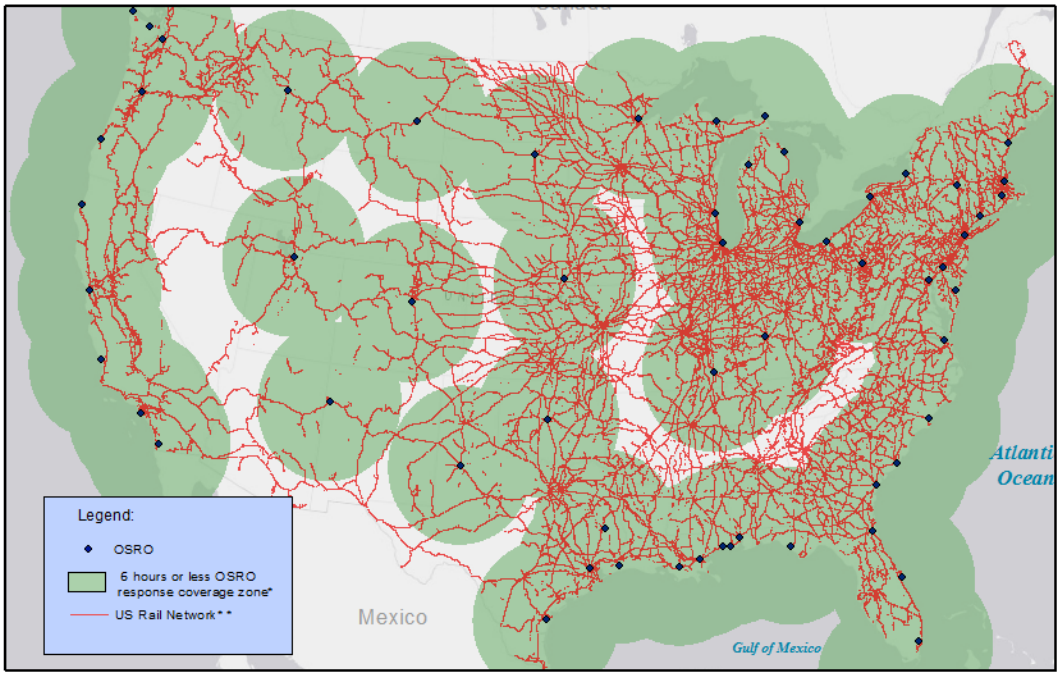
As seen in the map below, the existing OSRO network affords a level of response coverage that extends to the entirety of the continental U.S. PHMSA believes this lends support to our assumption that all potential rail routes transporting petroleum oil in the continental U.S. could be serviced by a USCG-certified OSRO in the event of a derailment within 12 hours or less, as required in this final rule. Of course, it is likely that response resources arrive onsite well before 12 hours after the derailment, but this is the cutoff for inclusion of response resources in the railroad's response zone.

[34] https://cgrri.uscg.mil/UserReports/WebClassificationReport.aspx
[35] For publicly-available OPS plans, please see: http://www.phmsa.dot.gov/pipeline/oil-spill-response-plan/. For the USCG OSRO Response Resource Inventory System, please see: https://cgrri.uscg.mil/UserReports/WebClassificationReport.aspx
[36] http://www.americansalvage.org/email-files/MER-Policy-Letter-03-13-OSRO-Classification_signed.pdf



Data source and notes: OSRO data compiled using publicly-available OPS plans and USCG OSRO RRIS. * A response timeframe of 12 hours or less assumes travel speed of 35 miles per hour "as the crow flies." This is equivalent to a distance of 420 miles. ** Rail network from US Census Bureau's 2015 national rail network, available publicly at: https://catalog.data.gov/dataset/tiger-line-shapefile-2015-nation-u-s-rails-national-shapefile.

PHMSA also mapped the OSRO network with 6-hour halos, and while there was considerable coverage, there were large notable areas of land that were not covered. These uncovered areas coincided with portions of the rail network. See the following map with 6-hour halos for comparison. The light grey portions of the map do not have USCG-certified OSRO coverage according to our assumptions and available data.



Data source and notes: OSRO data compiled using publicly-available OPS plans and USCG OSRO RRIS. * Mapping the response timeframe of 6 hours or less assumes travel speed of 35 miles per hour "as the crow flies." This is equivalent to a distance of 210 miles. ** Rail network from US Census Bureau's 2015 national rail network, available publicly at: https://catalog.data.gov/dataset/tiger-line-shapefile-2015-nation-u-s-rails-national-shapefile.

PHMSA expects that the existing OSRO network is sufficient to meet the final rule's standards for response planning; as such, PHMSA does not expect that the rule would result in incremental equipment costs to railroads. PHMSA notes that, even if a railroad were considering expanding the amount or types of response resources available, this action would not necessarily result in incremental equipment costs. On this point, PHMSA notes the possibility of using "master service agreements." In such an agreement, a railroad could contract for a specific type of response resource, and thereby ensure its availability in the event of a spill and meet the requirements of the rule; however, the agreement itself is not expected to impose any retainer fee or other significant costs to the railroad. This type of contract would only result in costs to the railroads in the event of a spill which requires the contracted response resource.

PHMSA emphasizes that regulatory flexibility has been incorporated into the OSRP requirements. Specifically, we enable railroads to retain a significant degree of discretion in the development of their plans, so that railroads will be able to plan according to the needs of the areas in which they operate. Put another way, the standard for response planning avoids what PHMSA considers to be prescriptive terms (e.g., requiring a USCG-certified OSRO, requiring a set quantity of equipment or any one type of equipment) for how railroads must meet the response planning standard. This works well with the concept of "response zones" and we feel that regulatory flexibility is justified given the wide variability of railroad operations and environments across the U.S. We believe this flexibility minimizes many of the cost impacts to railroads which would be incurred in response planning stages.

In addition to minimizing costs, PHMSA also believes that regulatory flexibility allows the regulated community to innovate to improve spill response. For example, railroads may be capable of transporting response resources to the site of a derailment using their own railway. In addition, it could be possible that response resources travel as part of the actual train configuration.

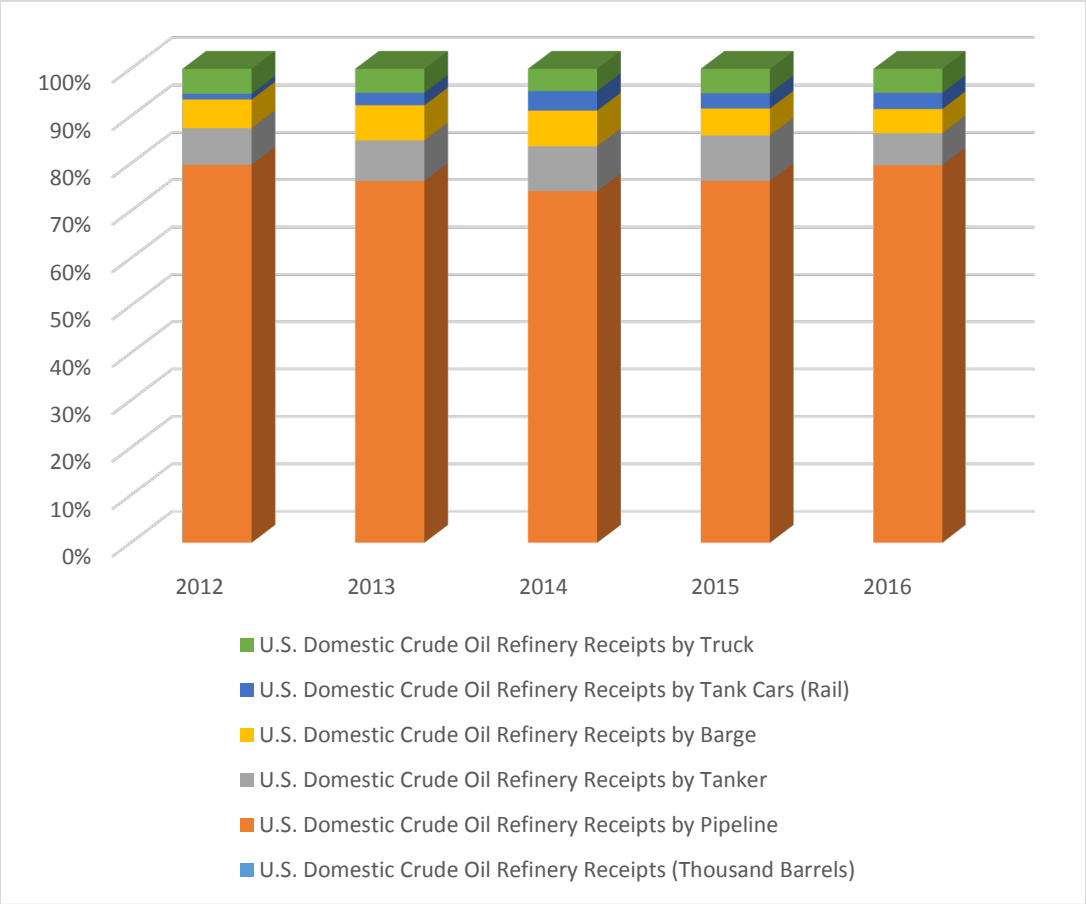
To supplement the discussion of existing response resources, we can direct the public to an example of an OSRO equipment list from the National Response Corporation (NRC).[37] This equipment list is publicly available on NRC's website and provides an illustration of the equipment that OSROs might be able to provide in response to an oil spill. PHMSA emphasizes that this is an example only.

PHMSA also notes that servicing the rail network may require less response resources than other transportation contexts. For example, worst-case discharges in the maritime context can involve significantly greater volumes of petroleum oil than would be encountered in the rail context.[38] Moreover, EIA data regarding domestic oil refinery receipts illustrates that rail transport was the lowest volume mode among the different modes that delivered oil to refineries from 2010–2017. In 2017, 80 percent of total receipts were delivered via pipeline with only 3 percent delivered via rail. This may mean that the response resources required to address the risk of spills involving crude-by-rail could be less than the level of resources needed to address the risk of spills involving, for example, pipeline, tanker, barge or truck transport. See Table 2 for this EIA data.

[37] See https://nrcc.com/dev/wp-content/myimages/2016/09/nrc-major-equipment-list.pdf or http://nrcc.com/pdf/Website.pdf. Note: PHMSA is not endorsing this organization nor suggesting that this list is what is required to meet the response planning requirements of this rule.

[38] As examples, the *Torrey Canyon* tanker spill off the coast of England that led to the establishment of the National Contingency Plan (NCP) in 1968 involved approximately 37 million gallons and the *Exxon Valdez* tanker spill involved approximately involved nearly 11 million gallons. These figures were found in the following USCG and NOAA links, respectively: (1) https://www.dco.uscg.mil/Portals/9/DCO%20Documents/National%20Strike%20Force/foscr/ASTFOSCRSeminar/References/FOSCGuideFinal.pdf?ver=2017-09-15-105040-910; and (2) http://response.restoration.noaa.gov/oil-and-chemical-spills/significant-incidents/exxon-valdez-oil-spill.

Table 2. Modal Share of U.S. Domestic Crude Oil Refinery Receipts, 2012-2016



Transportation Mode	Percent of Total Receipts by Year				
	2012	2013	2014	2015	2016
Pipeline	79.73%	76.31%	74.18%	76.33%	79.63%
Tanker (ship)	7.74%	8.57%	9.48%	9.58%	6.78%
Barge	6.06%	7.42%	7.53%	5.70%	5.10%
Rail	1.21%	2.64%	4.11%	3.23%	3.42%
Truck	5.26%	5.05%	4.70%	5.15%	5.08%

Data source: Energy Information Administration, https://www.eia.gov/dnav/pet/pet_pnp_caprec_dcu_nus_a.htm

1.3.3. Baseline Summary

The current regulations in 49 CFR part 130 provide a minimum standard for regulatory compliance. PHMSA estimates that railroads are currently complying with this minimum standard in the form of the "basic plan" required. Furthermore, PHMSA notes that many railroads may exceed the minimum "basic plan" standards and may be partially meeting the comprehensive plan requirements.

Given that similar oil spill response planning requirements are already in place for facilities, pipelines, and vessels, PHMSA believes that sufficient response resources are currently available.

In addition, this estimation is supported by our analysis of current response resource availability through USCG-certified OSROs. Based on our analysis of publicly available OSRO data, PHMSA finds evidence that the response standards required in this rulemaking are reasonable.

It is important to note that while this baseline analysis includes an examination of response resources, the costs of the final rule are for planning and information sharing—not costs of response. The costs of actually responding to a spill and related removal will be incurred by responsible parties (e.g., railroad) irrespective of this rulemaking.

In light of these considerations, PHMSA does not expect that the rule will result in significant additional resources being deployed to spills, or in the use of significant additional or more expensive resources at spill locations. The same types and quantities of resources will be deployed and used under this rule as compared to the status quo (absence of rulemaking)—the principal change PHMSA expects is that resources may be deployed and used sooner or more effectively through enhanced planning.

1.4. Universe of Affected Entities

1.4.1. Comprehensive OSRPs

The following entities would be subject to the final rule:

1. Any person transporting any liquid petroleum or non-petroleum oil in a quantity greater than 42,000 gallons per packaging must submit a comprehensive plan meeting the requirements of this subpart.

2. Any railroad that transports any single train carrying 20 or more tank cars of liquid petroleum oil in a continuous block or 35 such cars in a single train must submit a comprehensive plan.

    a. In determining number of tank cars, that person or railroad is not required to include tank cars carrying mixtures of petroleum oil not meeting the criteria for Class 3 hazardous material in 49 CFR 173.120 or containing residue.

3. A person or railroad meeting the requirements for a comprehensive plan need not submit a plan if otherwise excepted in 49 CFR 130.2(c).

The requirement for any person transporting any liquid petroleum or non-petroleum oil in a quantity greater than 42,000 gallons per packaging is consistent with the current requirement in 49 CFR 130.2. In the current Supporting Statement for Information Collection Request (ICR) 2137-0591,[39] PHMSA notes that no railroad has met the required threshold based on a carriage of oil greater than 42,000 gallons per tank car, and thus the estimated number of entities currently affected by the comprehensive plan requirements is zero.

[39] Information Collection Request. *Response Plans for Shipments of Oil - Supporting Statement.* OMB Control No. 2137–0591, available at: http://www.reginfo.gov/public/do/PRAOMBHistory?ombControlNumber=2137-0591

For determining the entities that will be affected by the threshold in this rulemaking, PHMSA uses the definition of HHFT established in the "Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains – Final Rule"[40] published on May 8, 2015. PHMSA narrowed the affected entities to only include railroads that transport crude oil and, in consultation with FRA, revised the estimated number of Class III carriers that are subject to the rulemaking. FRA provided PHMSA with this estimate based on 2013 STB confidential waybill sample and FRA inspector observations of HHFT crude oil train movements. PHMSA believes the estimated number of Class III impacted railroads is a conservative estimate and subject to uncertainty as not all Class III railroads submit their carload waybills for inclusion in the STB waybill sample report. Based on this assessment, PHMSA estimates there are 73 railroads (7 Class I, 11 Class II, and 55 Class III) that would be subject to this rulemaking. While this rulemaking applies to all petroleum products transported by rail, PHMSA believes that crude oil makes up a substantial percentage of the petroleum being transported in the quantities specified in the rulemaking. Therefore, PHMSA believes this estimate captures the universe of affected entities.

Table 3 presents the estimated number of affected entities for the oil spill response planning provisions in the final rule. This includes estimates for Class I, Class II, and Class III railroads that transport petroleum crude oil in the threshold established in this rulemaking. These estimates were derived for the purpose of estimating the costs and benefits associated with the final rule.

Table 3. Universe of Affected Entities – Oil Spill Response Planning

Railroad Class	Estimated Number of Affected Entities	Total Number of Railroads
Class I	7	7
Class II	11	11
Class III	55	730
Total Universe	73	748

1.4.2. Information Sharing

The universe of affected entities for the information-sharing requirements is different from the number of entities affected under the comprehensive response plan requirement. The applicability of this requirement is derived in part from the HM-251 final rule;[41] specifically, the definition of an HHFT and the information-sharing portion of the routing requirements relate to this final rule. The applicability also relates to the FAST Act, which outlines the information-sharing requirement in section 7302, paragraph (3).

The FAST Act specifies Class I railroads must provide advanced notification and information on high-hazard flammable trains to each State Emergency Response Commission (SERC), consistent with the notification requirements in the May 2014 Emergency Order. The FAST Act requires that SERCs receiving this advanced notification must provide the information to law enforcement

[40] 80 FR 26643, pp 26643–26750. May 8, 2015. https://www.federalregister.gov/articles/2015/05/08/2015-10670/hazardous-materials-enhanced-tank-car-standards-and-operational-controls-for-high-hazard-flammable

[41] "Hazardous materials: Enhanced tank car standards and operational controls for high-hazard flammable trains," May 8, 2015. 80 FR 26643.

and emergency response agencies upon request. The FAST Act directs the Secretary to establish security and confidentiality protections for electronic train consist information or advanced notification.

The FAST Act limits the applicability of the advanced notification requirements for HHFT to the Class I railroads (as described in section 20102 of title 49, United States Code). PHMSA is requiring that the information-sharing requirements apply to all railroads with HHFT operations. This requirement fulfills the Congressional mandate and is within PHMSA's regulatory authority. Through the authority of Federal hazmat transportation law and the delegation of this authority to PHMSA by the Secretary, PHMSA is responsible for overseeing a hazmat safety program that minimizes risks to life, property, and the environment inherent in the transportation of hazmat in commerce. Thus, in requiring that the information-sharing requirements apply to all railroads with HHFT operations, PHMSA believes we are faithfully addressing the provisions of the FAST Act, as well as acting in accordance with our delineated authority by additionally addressing the potential safety risks posed by the HHFT operations of Class II and Class III railroads. While we acknowledge that the HHFT operations of Class II and Class III railroads are relatively limited in comparison to those of Class I railroads, and thus are likely to pose fewer safety risks in the rail transportation system, we maintain that the HHFT operations of Class II and Class III railroads nonetheless pose safety risks that justify adherence to the information-sharing requirements of this final rule. In other words, it is PHMSA's belief at this time that the HHFT operations of Class II and Class III railroads, however limited, do not warrant an exception to the information-sharing requirements.

For these reasons, the potential universe of affected entities for the information-sharing provision includes all Classes of railroads that transport HHFTs transporting crude petroleum oil and ethanol, or 178 railroads (7 Class I, 11 Class II, and 160 Class III). Please note, the inclusion of rail carriers that transport ethanol explains the difference between this potential universe for information sharing and the number of affected entities for the comprehensive plan provisions.

For purposes of assessing costs for this provision, however, PHMSA assumes that there should be no additional costs for Class I railroads to comply with this revision per AAR's Circular OT-55, requiring AAR members to provide bona fide emergency response agencies or planning groups with specific commodity flow information covering all hazardous commodities transported through the community for a 12-month period in rank order. We assume this includes the information to be shared with SERCs and TERCs as required in this rule.

In addition, on May 7, 2014, DOT had issued an Emergency Restriction/Prohibition Order in Docket No. DOT-OST-2014-0067 (Order).[42] That Order required each railroad transporting 1 million gallons or more of Bakken crude oil in a single train in commerce within the United States to provide certain information in writing to the SERC for each State in which it operates such a train. PHMSA determined that 40 Class II and Class III railroads were part of this order and have already developed the required notification. Therefore, those Class II and Class III entities are only subject to the update and submission requirements included in this rulemaking.

[42] http://www.dot.gov/briefing-room/emergency-order

Table 4 presents the estimated universe of affected entities for the information-sharing provisions in the rule. For the number of affected entities for notification development, the calculation is as follows: 178 total entities – 7 Class I entities – 40 Class II and Class III entities = 131 Class II and Class III railroads. For the number of affected entities for updates, subtract the 7 Class I entities from the overall number of entities due to the precedence of FAST Act requirements.

Table 4. Universe of Affected Entities – Information Sharing

Provision	Estimated Number of Affected Entities
Notification Development	131 Railroads
Updates and Recordkeeping	171 Railroads

1.5. Alternatives Analysis

For purposes of determining the applicability threshold, PHMSA evaluated four options that would affect the number of entities subject to the comprehensive OSRP requirement. The details of these four options are described below, and Table 5 presents the total and annualized costs for these alternatives. PHMSA also considered other alternatives but did not analyze them because we lacked sufficient information. These alternatives include more and less stringent response time requirements for arriving at the scene of oil spill incidents, and more and less stringent definitions of "worst case discharge."

1.5.1. Alternative A: Tank cars carrying any quantity of petroleum crude oil

Under this alternative, any railroad carrying liquid petroleum of any volume would be required to submit a comprehensive OSRP. PHMSA consulted with subject matter experts at FRA to estimate the number of railroads that currently ship petroleum in any volume. Based on this evaluation, PHMSA estimates that there are approximately 756 railroads (7 Class I, 11 Class II, and 738 Class III) that transport liquid petroleum and thus would be subject to the requirement under this alternative. This represents the most stringent application of the requirement, to all railroads, and is the extreme upper bound.

Most of the approximately 738 small railroads that operate in the United States do not typically transport hazardous materials, including petroleum oil. Some of these railroads are switching yards, tourist operations, or in the "other" category and not "freight" category. Railroads carrying a smaller volume of petroleum (below the threshold established in this rule) may be sufficiently covered under the basic plan and do not meet the standards necessary to establish a comprehensive plan. PHMSA holds that imposing an applicability of any other number of tank cars that is less than 20 in a continuous block or 35 when dispersed throughout a train, would most likely be costly or burdensome and yield limited safety benefits due to the impacts on small entities as well as "manifest" train configurations involving petroleum oil. Therefore, PHMSA did not include a quantified estimate of the costs associated with this alternative.

1.5.2. Alternative B: 20 cars in a unit or 35 cars in a consist carrying petroleum crude oil (preferred option)

Under this alternative, any railroad carrying 20 or more tank cars of liquid petroleum oil in a continuous block or 35 such cars on a single train would be required to submit a comprehensive

OSRP. Under this alternative, the requirement would affect trains operating on all classes of track. Based on an evaluation of the 2013 Waybill Sample data and consultation with FRA, PHMSA has determined that approximately 73 railroads would be subject to the requirement under this alternative. As described in Section 1.4, this estimate includes 7 Class I, 11 Class II, and 55 Class III railroads. This is the requirement enacted by the final rule.

1.5.3. Alternative C: 20 cars in a unit or 35 cars in a consist carrying petroleum crude oil operating on Class 3 track or higher

The quantity thresholds are the same as those of Alternative B. However, under this alternative, only trains operating on Class 3 track or higher would be subject to the requirements. According to 49 CFR 213.9, the maximum allowable speed for freight trains is 25 mph on a Class 2 track and 10 mph on a Class 1 track. FRA estimates that approximately 20 of the Class III railroads identified in Alternative B would operate trains at speeds higher than 25 mph and thus operate on Class 3 track or higher. The remaining 35 Class III railroads that transport petroleum in the quantities required in this rule are assumed to operate on Class 1 or Class 2 track and are not included in this alternative. Based on this estimate, PHMSA has determined that approximately 38 railroads (7 Class I, 11 Class II, and 20 Class III) would be subject to the requirement under this alternative.

1.5.4. Alternative D: More than 70 cars in a consist carrying petroleum crude oil

Under this alternative, only railroads carrying more than 70 carloads of liquid petroleum oil in a consist would be required to submit a comprehensive OSRP. Based on an evaluation of the 2013 Waybill data and consultation with FRA, PHMSA has determined that approximately 53 railroads (7 Class I, 11 Class II, and 35 Class III) currently transport more than 70 carloads in a consist of liquid petroleum and thus would be subject to the requirement under this alternative.

1.5.5. Alternative E: No Action

Under this alternative, the current thresholds in 49 CFR part 130 would apply for the development of a comprehensive response plan. This requirement applies to any person transporting any liquid petroleum or non-petroleum oil in a quantity greater than 42,000 gallons per packaging. In the current Supporting Statement for Information Collection Request (ICR) 2137-0591,[43] PHMSA determined that there may be up to 2 railroads that engage in the transportation of specifically identified tank cars capable carrying a quantity of oil greater than 42,000 gallons. However, since this regulatory requirement was promulgated, no railroad has met the required threshold based on a carriage of oil greater than 42,000 gallons per tank car, thus the estimated number of entities affected by this alternative is zero. Since there would be no additional costs associated with this alternative, PHMSA did not include this alternative in the summary table below.

[43] Information Collection Request. *Response Plans for Shipments of Oil - Supporting Statement.* OMB Control No. 2137–0591. http://www.reginfo.gov/public/do/PRAOMBHistory?ombControlNumber=2137-0591

1.5.6. Summary

Under alternatives B through D, the number of Class I and Class II railroads affected by the thresholds does not change. However, the number of Class III railroads that would be subject to the final rule ranges from 55 to 20 railroads. The total costs over the 10-year period considered in this analysis, discounted at 7 percent, range from $11 million to $4 million for Class III railroads. Table 5 provides an overview of the 10-year total and annualized costs by railroad class for each alternative evaluated.[44]

PHMSA also looked at other plan requirements to evaluate potential options to reduce burden or minimize costs for plan holders. For example, rather than requiring that plans be resubmitted every 5 years as is required by the U.S. Coast Guard (33 CFR 151.27), railroads would only be required to re-submit their plans to PHMSA if updates are made to address new or different operating conditions or information that would substantially affect the implementation of the response plan. In addition, PHMSA identified several cost uncertainties and conducted sensitivity analyses that are discussed in section 2.4 of this document.

Table 5. Overview of Total and Annualized Costs per Railroad Class by Alternatives (7% Discount)

Alternative	Class of Railroad	Number of Affected Railroads	Total Cost (7%)	Annualized Cost (7%)
B	Class I	7	$4,929,142	$701,799
	Class II	11	$3,142,468	$447,417
	Class III	55	$11,770,121	$1,675,800
	Total	**73**	**$19,841,731**	***$2,825,016***
C	Class I	7	$4,929,142	$701,799
	Class II	11	$3,142,468	$447,417
	Class III	20	$4,280,044	$609,382
	Total	**38**	**$12,351,654**	***$1,758,598***
D	Class I	7	$4,929,142	$701,799
	Class II	11	$3,142,468	$447,417
	Class III	35	$7,490,077	$1,066,418
	Total	**53**	**$15,561,687**	***$2,215,634***

1.6. Timeframe for the Analysis

PHMSA estimates that the economic effects of this rulemaking, once finalized and adopted, will be sustained indefinitely. Notwithstanding this, because of the difficulty of and uncertainty associated with forecasting effects into the far future, PHMSA assumes a 10-year timeframe to outline, quantify, and monetize the costs and benefits of the proposal and to demonstrate the net effects of the proposal.

[44] Table 5 only includes the costs for oil spill response planning, and does not include alternatives to the costs for information sharing. Those costs would be the same under each of these scenarios for the railroads subject to the information sharing provision.

2. Costs

The following sections provide an overview of the estimated costs for railroads subject to the final rule. For the development of comprehensive OSRPs, those costs include: plan development, submission, and maintenance; contract services for OSROs; and training and exercises. For information sharing, those costs include notification development, and periodic updates and submission. Total costs are presented in Section 2.3 of this document. The costs to the Federal Government for the review and approval of the comprehensive OSRPs and review of the information sharing notifications were not included in the overall cost estimates for this rule. However, an estimate of those costs is included in Section 2.2.3 of this document, and we have provided a table in the "Total Costs" section to illustrate the increase in the total costs of the rule if costs to the Federal Government were included.

2.1. Comprehensive OSRPs

2.1.1. Costs of Plan Development, Submission, and Maintenance

The final rule requires several specific elements to be included in the comprehensive OSRP. These items are summarized below. The complete list of requirements can be found in the final rule. This section will discuss the costs associated with the specific requirements for plan development, submission, and maintenance. Sections 2.1.2 and 2.1.3, respectively, discuss the costs associated with the requirement to ensure by contract or other means response resources and the costs associated with conducting drills and training exercises.

2.1.1.1. Costs for Plan Development and Updates

Each railroad subject to the final rule must prepare and submit a comprehensive OSRP that includes a plan for responding, to the maximum extent practicable, to a worst-case discharge and to a substantial threat of such a discharge of oil. In addition, each railroad shall review its plan in full at least once every 5 years from the date of the last approval.

A comprehensive plan must include:

- Core Plan: A core plan includes an information summary and any components that do not change between response zones.
- Response Zone Appendix: For reach response zone, a railroad must include a response zone appendix to provide the information summary and any additional components of the plan specific to the response zones.

Currently, railroads are required to complete a basic OSRP for oil shipments in a package with a capacity of 3,500 gallons or more. Railroads that are subject to comprehensive plans are required to make several additions to what is already established in their basic plans. For example, these additions include:

- Ensure the plan is consistent with the NCP and applicable ACPs.
- Identify a QI with full authority to implement response actions.

- Identify and ensure the availability of personnel and equipment to respond to worst-case discharges.
- Describe the training, equipment testing, exercises, and response activities that will be undertaken to ensure safety and mitigate spills.
- Describe the procedure for updating and resubmitting response plans when significant changes occur.

In addition to the core comprehensive plan, railroads are also required to identify response zones that are included as appendices to the core plan. Railroads will determine how many response zones they need to develop. However, for purposes of estimating costs associated with this rule, PHMSA, in consultation with FRA, evaluated the current network of crude oil transportation by rail to determine an estimated number of response zones differentiated by railroad class. Based on this evaluation, PHMSA has estimated that the average response zone will likely cover approximately two States. PHMSA estimates that each Class I railroad will likely develop eight response zones in addition to the core plan, Class II railroads will likely develop two response zones, and Class III railroads will develop one response zone. Many Class III railroads' operations are limited to one to three states, so using two states made sense in developing a kind of lowest common denominator for the size of a response zone. This would limit the impact on smaller railroads.

For purposes of determining the amount of time that would be necessary to prepare the comprehensive plan and response zone appendixes, PHMSA consulted with OSROs in development of the NPRM and consulted with third party OSRP plan writers in response to comments to the NPRM. We also evaluated estimates used in previous rulemakings requiring non-railroad entities to develop and submit a comprehensive OSRP, as well as estimates used in PHMSA's information collection request and comments to the NPRM.[45,46] On the basis of comments to the NPRM and input from a third party OSRP plan writer, PHMSA estimates the level of effort will be similar for developing a Class I railroad or shortline core plan or a response zone plan.

Table 6 provides an estimate of the amount of time necessary for each class of railroad to develop the comprehensive plan and response zone appendices. PHMSA estimates it will take 40 hours of senior time, 40 hours of administrative time, and 100 hours of mid-level staff for the core plan and the same number of hours for developing a plan per response zone (RZ). The cost then is estimated at $9,407 per core plan or RZ, and thus a total of $18,815 for developing a plan for a Class III railroad as shown in the calculations below.

[45] Nontank Vessel Response Plans and Other Vessel Response Plan Requirements – Final Regulatory Analysis and Final Regulatory Flexibility Analysis for the Final Rule. USCG-2008-1070. May 2013. http://www.regulations.gov/#!documentDetail;D=USCG-2008-1070-0046.

[46] Information Collection Request. *Response Plans for Onshore Oil Pipelines – Supporting Statement.* OMB Control No. 2137-0589.

Table 6. Overview of Estimated Plan Development Hours per Railroad by Railroad Class

Class of Railroad	Number of Response Zones	Comprehensive Plan Development Time	Response Zone Development Time (per zone)	Total Hours per Railroad
Class I	8 zones	180 hours	180 hours	1,620 hours
Class II	2 zones	180 hours	180 hours	540 hours
Class III	1 zone	180 hours	180 hours	360 hours

The hourly labor rate for a manager used to estimate the cost of initial plan development in the implementation year is $75.53. This labor rate is based on the median wage estimate ($47.74) from the Bureau of Labor Statistics (BLS) *Occupational Employment and Wages, May 2016* for the wage series "11-1021 General and Operational Managers."[47] In addition, to calculate the hourly wage rates for each year of the analysis, PHMSA inflated this wage by 56 percent to account for fringe benefits.[48] Finally, the wage was adjusted for 2018 and subsequent years in this analysis based on an estimated 1.1-percent annual growth rate in median real wages.[49] This results in an estimated hourly wage of $75.53 for the manager involved in the initial development of the comprehensive plan and response zones. Similarly, PHMSA estimated the hourly labor rates for an administrative and a rail transportation worker at $42.50[50] and $46.86[51], respectively.

As discussed above, the initial plan development would require 180 hours of effort, which would result in a cost in 2018 of approximately $9,407.20 per core plan (40 hours of manager time * $75.53 per hour + 40 hours of administrative time * $42.50 + 100 hours of mid-level staff * $46.86). As noted above, a similar level of effort will be required to develop a plan for a response zone. The response zones would require an additional $9,407 per plan.

In addition to initial plan development, railroads subject to this rule are required to update their plan to address new or different conditions or information, and review their plan in full at least every 5 years from the date of the last approval. While it is likely that not all railroads will need to completely revise their plans after each review period, PHMSA does not have information available to estimate the extent of these updates. Therefore, for purposes of this analysis, PHMSA assumes that all railroads subject to this rule would conduct a plan review and update every 5 years. This is consistent with assumptions made in OPS' 2004 analysis for onshore pipelines.

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[47] https://www.bls.gov/oes/2016/may/oes111021.htm

[48] BLS does not publish data on fringe benefits for specific occupations, but it does for broad industry groups in its Employer Costs for Employee Compensation release. This regulatory evaluation uses the average hourly wage of $25.75 and average hourly benefits of $14.49 for private industry workers in "transportation and warehousing" to estimate that fringe benefits are equal to 56 percent ($14.49 / $25.75) of wages. Source: Bureau of Labor Statistics. *Table 10: Employer costs per hour worked for employee compensation and costs as a percent of total compensation: Private industry workers, by industry group, December 2017.* http://www.bls.gov/news.release/pdf/ecec.pdf

[49] Based on the Median Usual Weekly Earnings (MUWE), in constant dollars, derived by BLS from the Current Population Survey (Series LEU0252881600 – not seasonally adjusted), PHMSA estimated a 1.1% annual growth rate.

[50] This labor rate is based on the median wage estimate ($26.86) from the Bureau of Labor Statistics (BLS) *Occupational Employment and Wages, May 2016* for the wage series "43-6011 Executive Secretaries and Administrative Assistants."

[51] This labor rate is based on the median wage estimate ($29.62) from the Bureau of Labor Statistics (BLS) *Occupational Employment and Wages, May 2016* for the wage series "53-4099 Rail Transportation Worker, all other."

Further, PHMSA estimates the recurring burden with reviewing the initial plan as half of the burden needed to develop the initial plan development.

Table 7 provides an overview of the estimated cost per railroad for the initial development of the comprehensive plan in year 1. This cost estimate also includes review of the plan every 5 years.

Table 7. Estimated Plan Development Costs per Railroad by Railroad Class

Class of Railroad	Level of Effort (Hours) for Core Plan	Level of Effort (Hours) for Response Zone(s)	Total Hours per Railroad (core plan + response zones)	Weighted Average Hourly Compensation of Railroad Employees	Plan Development Cost per Railroad
Class I	180 hours	1,440 hours	1,620 hours	**$52.26**	**$84,665**
Class II		360 hours	540 hours		**$28,222**
Class III		180 hours	360 hours		**$18,814**

In developing these estimates, PHMSA evaluated public comments in response to the ANPRM and NPRM. In response to the ANPRM, PHMSA received public comments on the cost of plan development that ranged from $12,000 to $500,000. AAR and ASLRRA estimated costs would be $100K to $500K per railroad. It could be argued that PHMSA's estimate for Class I plan development costs are comparable to the lower-bound estimate given by AAR/ASLRRA in the ANPRM ($84,666 vs. $100,000). Given the ANPRM contained no specific proposals, AAR and ASLRRA noted they could not provide a specific or accurate cost estimate. Other comments to the ANPRM regarding plan development costs were approximate and lacked detail.

In response to the NPRM, PHMSA received a few comments regarding plan development costs. Unfortunately, they were not more detailed than the comments provided to the ANPRM. This made it difficult to revise the cost estimates provided in the preliminary RIA. For example, API asked that PHMSA "look more closely at the time and effort required to develop and implement plans initially."[52] In addition, AAR commented, "PHMSA's hourly estimates for completing the 'Core Plan and Response Zone' documents are underestimated." Please note, AAR and API did not supply to the NPRM data or comparative estimates with which to revise our estimates. Nevertheless, PHMSA engaged with third party OSRP plan writers in response to the comments and was successful in receiving one set of updated estimates for the level of effort required to develop a plan. These updated estimates for plan development are reflected in this RIA. Specifically, the preliminary RIA estimated 80 hours to develop the core plan and 15 hours per response zone. In this RIA, we estimate 180 hours of effort, split across 3 occupational groups, as well as 180 hours for each response zone. This amounts to doubling the effort for core plan development and increasing by 12-fold the effort estimated to create a single response zone appendix. PHMSA feels this revision is responsive to the commenters' concerns. If additional data were supplied, PHMSA may have had the opportunity to evaluate other cost estimates, but this was not the case.

[52] Comment to HM-251B NPRM, American Petroleum Institute (API), pg. 2, available at: https://www.regulations.gov/document?D=PHMSA-2014-0105-0322 [hereinafter "API comment"]

PHMSA also considered estimates for plan development for non-railroad entities, such as pipeline operators. For example, in the regulatory impact analysis for OPS's 2005 final rule titled "Response Plans for Onshore Oil Pipeline," OPS estimated that per facility plan development costs would range from $16,000 to $1.9M. The $1.9M estimate was for mega-facilities covering over 100 counties. We also mentioned this OPS-derived estimate in the preliminary RIA and did not receive public comment suggesting that it, or an adaptation thereof, would be better suited for our final analysis. In the supporting statement developed for the ICR to authorize the collection of information required in the response plans for onshore pipelines, OPS estimated initial plan development would require 40–80 hours[53] of engineering staff time per standalone plan.[54]

Moreover, PHMSA evaluated estimates used for commercial, nontank vessels that are required by USCG to develop and submit OSRPs.[55] In the final regulatory analysis developed for the *Nontank Vessel Response Plans and Other Vessel Response Plan Requirements* (NTVRP),[56] the USCG estimated that the initial OSRP developed by the plan holder would require 40 hours of labor time from a senior staff member.[57]

In comparison, PHMSA's plan development cost estimates for railroads' plans are lower than AAR/ASLRRA ANPRM comments and OPS' 2005 final rule, but higher than OPS' ICR estimate. Our estimates remain uncertain, and it must be considered that our analysis is a representation of expected effects; not an infallible prediction of impacts. In further support of our final RIA estimates, we believe it is likely that many of the railroads that would be subject to the final rule, particularly Class I and Class II railroads, have already developed response plans that include similar provisions to what is included in comprehensive plans. These railroads would only need to update their plans to be consistent with the requirements and may not require the entire time estimated for plan development. As such, it could be argued that our plan development cost estimates are conservative, or over-estimates, in the sense that we present the costs as if the affected railroad needed to develop a plan "from scratch." We see this as an additional justification for our overall plan development cost estimate, but acknowledge the uncertainty affecting these estimations.

Further, while there are technical differences in the information that would be needed for a railroad to develop a comprehensive OSRP (as compared to a pipeline- or vessel-related plan), the type of information being requested is substantively similar to the requirements for these other entities. Thus, PHMSA believes our revised estimates are reasonably responsive to public comment and reflect a workable estimation of the cost to develop a comprehensive plan. Data uncertainties and limitations limited the extent to which PHMSA could consider additional cost estimations.

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[53] Final Regulatory Evaluation of the Response Plan Requirement for Transportation-Related Onshore Oil Pipelines, Office of Pipeline Safety (OPS), Research and Special Programs Administration (RSPA), August 2004, see pg. 7-7.
[54] Information Collection Request. *Response Plans for Onshore Oil Pipelines – Supporting Statement.* OMB Control No. 2137-0589.
[55] 33 CFR part 155.
[56] Nontank Vessel Response Plans and Other Response Plan Requirements. *Federal Register***,** *78*(189), 60100–60135. September 30, 2013.
[57] Nontank Vessel Response Plans and Other Vessel Response Plan Requirements – Final Regulatory Analysis and Final Regulatory Flexibility Analysis for the Final Rule. USCG-2008-1070. May 2013, available at: http://www.regulations.gov/#!documentDetail;D=USCG-2008-1070-0046.

2.1.1.2. Costs for Plan Submission

The final rule requires plans to be submitted to PHMSA.

In addition, any significant changes to the plan also must be submitted to PHMSA. Specifically, under the final rule, railroads are required to update their plan to address new or different conditions or information, and each railroad must review its plan in full at least every 5 years from the date of the last approval. If a new or different operating conditions or information would substantially affect the implementation of the response plan, the railroad must immediately modify its plan to address such a change and must submit the change to PHMSA within 90 days. While it is likely that not all railroads will need to submit an updated plan after each review period, PHMSA does not have information available to estimate the likelihood of updates requiring a submission. Therefore, for purposes of this analysis, PHMSA assumes that all railroads subject to the rule will submit their plans every 5 years.

PHMSA estimates that it would take an administrative employee approximately 0.5 hours to assemble and submit the final plan to FRA. The hourly labor rate used to estimate the cost of initial plan development is $42.50. This labor rate is based on the median wage estimate ($26.86) from the BLS *Occupational Employment and Wages, May 2016* for the wage series "43-6011 Executive Secretaries and Executive Administrative Assistants."[58] PHMSA inflated this wage by 56 percent to account for fringe benefits and adjusted the wage for 2016 and subsequent years in this analysis based on an estimated 1.1-percent annual growth rate in median real wages.

Each plan submission would result in a cost of approximately $21 per plan (0.5 hours × $42.50 per hour, rounded). PHMSA assumes the plans will be submitted electronically to PHMSA and would not require any additional mailing costs. This cost would be the same for Class I, Class II, and Class III railroads.

2.1.1.3. Costs for Plan Maintenance and Recordkeeping

The final rule requires each railroad to:

- Maintain a copy of its plan at the railroad's principal place of business.
- Provide a copy of its core plan and the appropriate response zone appendix to each QI and alternate.
- Provide a copy of the information summary to each dispatcher in response zones identified in the plan.

In addition, the final rule includes the following review or maintenance requirements for the response plans:

- Each railroad must include procedures to review the plan after a discharge requiring activation of the plan to evaluate and record the plan's effectiveness.
- Each railroad shall update its plan to address new or different conditions or information.

[58] Bureau of Labor Statistics. *Occupational Employment and Wages, May 2016; Wage Series 43-6011 Executive Secretaries and Executive Administrative Assistants.* Retrieved from http://www.bls.gov/oes/current/oes436011.htm.

- If a new or different operating condition or information would substantially affect the implementation of the plan, the railroad must modify its plan to address such a change and, within 90 days of making such a change, submit the change to PHMSA.

While maintenance activities will vary from year to year, for purposes of this analysis PHMSA assumes that annual maintenance and recordkeeping will require approximately 10 percent of the total time of plan development. This estimate is consistent with maintenance estimates used in the information collection for both onshore pipeline[59] and commercial vessel[60] OSRPs. This would result in approximately 18 hours per year for the core plan and 18 hours per year for each response zone for railroads subject to the final rule (180 hours / 10 = 18 hours).

In addition to questioning the initial plan development costs, API's comment to the NPRM and preliminary RIA indicated that PHMSA underestimated the time and effort required to update and review plans annually.[61] While PHMSA is using the same percentage of plan development costs to represent annual plan maintenance costs (10 percent), we have nevertheless revised upward these costs since they are derived from the plan development costs. For example, a Class I railroad was estimated in the preliminary RIA to spend 20 hours maintaining their comprehensive plan annually; in the final RIA, it is estimated that this review would take 162 hours, an approximately 7-fold increase. Thus, by increasing plan development costs, we also increased plan maintenance costs, and we believe we have reasonably responded to this public comment. Further, PHMSA believes our annual plan maintenance cost may be a conservative estimate, since there may be years in which no changes are made to the plan and no additional distribution is needed. Table 8 provides an overview of the costs of maintenance and recordkeeping requirements by railroad class. The labor rate used is the same rate as the plan development, or $52.26 discussed in Section 2.1.1.

Table 8. Estimated Plan Maintenance and Recordkeeping Costs per Railroad by Railroad Class

Class of Railroad	Level of Effort (Hours) for Core Plan	Level of Effort (Hours) for Response Zone(s)	Total Hours per Railroad	Average Hourly Compensation of Railroad Employee	Cost per Plan per Railroad
Class I	18 hours	144 hours	162 hours	**$52.26**	**$8,466**
Class II		36 hours	54 hours		**$2,822**
Class III		18 hours	36 hours		**$1,881**

2.1.2. Costs for Response and Mitigation Activities for Comprehensive Plans

The final rule requires plan holders to identify and ensure by contract or other means the resources necessary to remove, to the maximum extent practicable, a worst-case discharge and to mitigate or prevent a substantial threat of a worst-case discharge. It requires railroads to describe in their plans the response resources available to arrive onsite within 12 hours after the discovery of a

[59] Information Collection Request. *Response Plans for Onshore Oil Pipelines- Supporting Statement.* OMB Control No. 2137-0589.
[60] Information Collection Request. *Vessel and Facility Response Plans (Domestic and Int'l), and Additional Response Requirements for Prince William Sound, Alaska.* OMB Control No. 1625-0066.
[61] See API comment, pg. 2

worst-case discharge or the substantial threat of one. It requires railroads to implement their plans for spills affecting navigable waters, the adjoining shorelines of navigable waters, or the natural resources of the United States. However, PHMSA believes the actual costs of response cannot be attributed to this regulatory action because the costs of response and other associated costs, such as clean up and remediation of the derailment site, would be the responsibility of the responsible party, irrespective of this rulemaking.

For purposes of this analysis, PHMSA assumes that railroads subject to this rule will contract and use the services of a spill response provider, such as a USCG-certified OSRO, to comply with this requirement in their response plans. Sometimes, this kind of contract involves a retainer fee that is paid annually to the response provider in order to ensure appropriate resources are available in the event of a worst-case discharge or the threat of one. In other cases, an annual retainer fee is not required. We further assume that USCG certification as an OSRO is sufficient to ensure that the OSRO has the necessary response resources to respond to a worst-case discharge as defined in this final rule and that the retainer fee is sufficient to ensure the availability of all such resources.

The availability of response resources is separate from the deployment and use of these resources to respond to spills. As noted above, PHMSA does not assign any cost to this final rule from deploying or using response resources to respond to spills because these costs are expected to be incurred by the responsible party irrespective of this rulemaking. Thus, PHMSA does not expect that this rule will result in significantly different or additional resources to be deployed to spills.

In addition, we acknowledge that many railroads are likely to already have a contract in place with an OSRO, with or without an annual retainer fee, signaling an existing level of compliance with the requirements. However, PHMSA notes the importance of the regulatory baseline, as opposed to the response planning baseline. Under 49 CFR part 130, railroads transporting HHFTs of petroleum oil are not currently required to have a comprehensive plan and thus, are not required to ensure by contract or other means the availability of resources to address a worst-case discharge. This regulatory change is significant to the extent that PHMSA feels it is reasonable to present a conservative estimate of response costs and specifically, the costs of retainer fees. We do this by estimating that every affected entity will face an annual OSRO retainer fee, which represents the cost of contracting response resources to comply with the rule. PHMSA does not have information regarding the number of affected entities that already have contractual agreements in place, so we are unable to make different assumptions. Again, some OSROs may not require an annual retainer fee, but for the purposes of this analysis and the need to address uncertainty in this area, we present a conservative approach to response cost estimation.

The primary drivers for the retainer fee costs are likely to be the geographic scope of coverage the OSRO would provide and the scale of the worst-case discharge that would need to be covered. While these costs will likely vary among response providers, PHMSA during the development of the NPRM interviewed individuals from two OSRO companies to determine an estimate for these services. Please see Appendix E in the preliminary RIA for the results of these interviews.[62] PHMSA estimated an OSRO retainer fee for each response zone based on these interviews and additionally scaled the fee based on the size of the railroad. The number of response zones per

[62] The preliminary RIA can be found in the Supporting Documents folder under Docket ID: PHMSA-2014-0105-0241. The questions and responses can be found in Appendix E of that document.

railroad is the same as those estimated for plan development costs. PHMSA did not receive public comment regarding retainer cost estimates, so is maintaining the original estimates in the final RIA.

For additional background on potential OSRO retainer fees, PHMSA evaluated the estimates used in previous rulemaking efforts for evaluating the potential OSRO fee. Based on a survey with OSROs conducted as part of their rule development process, the USCG estimated that the average annual OSRO fee was $224 per vessel.[63] However, the USCG also cited several factors that could influence that cost, such as whether the OSRO was being contracted through the vessel's Protection and Indemnity club. In the 2005 final Onshore Pipeline Rule, OPS estimated an annual response resource cost range of $10,000–$100,000 (in 2003 dollars) per facility.[64] Specifically, OPS estimated OSRO fees would be $10,000 per year for pipeline facilities with a small worst-case discharge (defined as a less than 7,500 barrel discharge), $30,000 per year for facilities with a medium worst-case discharge (7,501 – 35,000 barrel discharge), and $100,000 per year for facilities with a large worst-case discharge (more than 35,000 barrels). OPS derived these estimates from a consultation with an emergency response provider and also cited several factors that could influence the cost for a facility, such as the volume of the worst-case discharge for which facilities must provide response capabilities and whether facilities must also comply with U.S. Environmental Protection Agency (EPA) regulations under OPA 90. In addition, PHMSA found publicly available information from response providers that marketed "no retainers" or "no cost" master service agreements. Additional discussion of our research is included in Appendix E in the preliminary RIA.

Given the variability in the estimates used in the previous rulemakings, and the different units of analyses (USCG used per vessel, OPS used per facility, and this RIA uses per railroad per response zone), PHMSA focused on the estimate derived through the discussions with the two OSRO companies mentioned above. One provider explained that they use a risk model to determine their retainer fees, and typically derived facility retainer fees of $0.05/barrel; however, they have not developed fees for railroads using this methodology. Another provider estimated that their typical retainer fees for land-based facilities, including railroads, would range from approximately $2,500 to $10,000 per year and placed Class I railroads in the middle to lower end of that range. In addition, they estimated that they would likely charge Class II railroads a retainer fee on the lower end of the range, and Class III railroads may not even require a retainer fee depending on the location of the railroad and their potential equipment needs. For purposes of this analysis, PHMSA used this information as the primary source for estimating OSRO fees; however, a retainer fee was included for Class III railroads. In Section 2.4.2, PHMSA conducted a sensitivity analysis evaluating a lower or no-cost approach for a retainer fee for Class III railroads, as an alternative viewpoint. PHMSA estimates that the annual retainer fee for an OSRO will range from $2,500 to $5,000 for each response zone, differentiated by railroad class. Table 9 provides an overview of the costs by railroad class.

[63] Nontank Vessel Response Plans and Other Vessel Response Plan Requirements – Final Regulatory Analysis and Final Regulatory Flexibility Analysis for the Final Rule. *USCG-2008-1070*, May 2013. Retrieved from http://www.regulations.gov/#!documentDetail;D=USCG-2008-1070-0046

[64] Pipeline Safety: Response Plans for Onshore Transportation-Related Oil Pipelines. *Federal Register*, *70*(35), 8734–8748. February 23, 2005. http://www.gpo.gov/fdsys/pkg/FR-2005-02-23/pdf/05-3257.pdf

Table 9. Estimated Annual OSRO Retainer Fee per Railroad by Railroad Class

Class of Railroad	Retainer Fee per Response Zone	Number of Response Zones	Annual Cost per Railroad
Class I	$5,000	8	**$40,000**
Class II	$3,000	2	**$6,000**
Class III	$2,500	1	**$2,500**

2.1.3. Cost for Training and Exercises

The final rule includes the following training and exercise requirements:

- Training: The railroad must certify in the response plan that it conducted training to ensure that:
    - All railroad employees subject to the plan know their responsibilities under the comprehensive spill response plan and the name of, and procedures for contacting, the QI or alternate on a 24-hour basis.
    - Reporting personnel must additionally know the content of the information summary of the response plan, the toll-free telephone number of the National Response Center, and the notification process required by the final rule.

  Designated employees must receive the training required by this subpart at least once every 5 years.
- Exercises: A railroad must implement and describe a drill program following the National Preparedness for Response Exercise Program (PREP) guidelines. As an alternative, a railroad choosing not to follow PREP guidelines must have a drill program that is equivalent to PREP. The plan must include a description of the drill procedures and programs the railroad uses to assess whether its response plan will function as planned, including the types of drills and their frequencies.

2.1.3.1. Costs for Training

The final rule requires railroads subject to the rule to certify in their response plan that training has been conducted for all employees subject to the plan and all reporting personnel. The purpose of this training is to ensure that the applicable employees know their responsibilities under the plan, the plan content, and the notification procedures. This training must be conducted at least once every 5 years.

Based on discussions with subject matter experts at FRA, PHMSA determined that approximately 80 employees per Class I railroad, 40 employees per Class II railroad, and 16 employees per Class III railroad would be subject to this training requirement.[65] For purposes of this analysis, PHMSA assumes that 8 hours of training would be required per employee every 5 years and that training would involve senior managers, using the senior management wage ($75.53). PHMSA anticipates that railroads have likely conducted some training in accordance with basic plans and through

[65] These estimates assume that railroads would need to train two staff members per shift, covering three shifts per day, and that the total number of employees would vary by railroad size (class).

voluntary actions, and notes that this estimate of 8 hours per training cycle is also consistent with the training estimates derived in the onshore pipeline final rule and OPS' accompanying regulatory evaluation.[66] However, subject matter experts at FRA suggested that the training may take up to 40 hours per cycle. For this reason, PHMSA conducted a sensitivity analysis in Section 2.4.2 using this scenario.

In addition to suggesting that plan development and annual maintenance cost estimates were low, API also suggested in comment to NPRM that training costs were underestimated. Unfortunately, API did not supply alternative training cost data with which to revise our preliminary estimates. Moreover, API did not indicate quantitatively the extent to which PHMSA underestimated training costs (e.g., 10 percent too low, 25 percent too low). Given the absence of data given in the public comment period, PHMSA attempted to solicit additional information on training costs from third party OSRP plan writers with training services experience, but did not obtain such information. Ultimately, our training cost estimates resemble those given in the preliminary RIA, but with minor revisions due to changes in salary input values.

Please note, this training ensures knowledge of the plan on the part of subject employees. Exercise costs according to PREP guidelines are accounted for separately from training costs, although the two areas are interrelated. The full extent of railroad training programs for hazmat and oil spill response cannot be attributed to this rule; the costs presented here are a representation of the *incremental* cost to railroads' training and exercise programs to ensure knowledge of the plan and alignment with PREP or PREP-equivalent guidelines. Further, there may be differences among the affected railroads' training and exercise programs; the costs estimated here are a generalization.

Table 10 provides an overview of the estimated training costs per training event for each class of railroad.

Table 10. Estimated Training Costs per Railroad per Event by Railroad Class

Class of Railroad	Number of Employees	Hours per Employee	Wage Rate	Total Cost per Railroad per Event
Class I	80	8	$75.53/hour	**$48,339**
Class II	40	8	$75.53/hour	**$24,170**
Class III	16	8	$75.53/hour	**$9,668**

2.1.3.2. Costs for Exercises

The final rule requires railroads subject to the rule to implement an exercise program in accordance with the USCG's PREP guidelines, or an equivalent program. There are three categories of annual requirements that apply to railroads subject to the rule:

1. QI Notification Exercises
2. Incident Management Team (IMT) Exercises
3. Equipment Deployment Exercises

[66] Pipeline Safety: Response Plans for Onshore Transportation-Related Oil Pipelines. *Federal Register*, *70*(35), 8734–8748. February 23, 2005. http://www.gpo.gov/fdsys/pkg/FR-2005-02-23/pdf/05-3257.pdf

For purposes of this analysis, PHMSA referred to the USCG's Nontank Vessel Response Plan and Other Vessel Response Plan Final Regulatory Analysis, which includes several identical or similar exercise requirements.[67] While the content of the exercises will vary depending on the transportation context, PHMSA believes that the estimated number of staff members and time burden would likely be similar for railroads.

First, the QI notification exercise is an annual exercise intended to ensure that the QI and alternate QI identified in the response plan will respond as expected and carry out their duties in the event of an incident. This drill includes contacting the QI by telephone or radio with a confirmation of receipt. For purposes of this analysis, PHMSA assumes that the QI and employee conducting the exercise will likely be senior members of the railroad staff or management team, and uses the senior manager wage ($75.53) for this exercise. Each event will require 2 hours of the manager's time and 2 hours of either the QI or alternate QI's time.

Second, the IMT exercise is an annual exercise in which the response plan is utilized to ensure that the IMT is familiar with the plan and can use it effectively to conduct a response. At least one IMT exercise in a triennial cycle must involve a worst-case discharge scenario. According to interagency input, IMT exercises include practicing in a Unified Command structure, implementing a Planning Cycle, generating an Incident Action Plan, and establishing an Environmental Unit.

For purposes of this analysis, PHMSA assumes that the IMT exercise will take approximately 8 hours to complete and that that two senior managers from the railroad and two senior employees, likely the QI and alternate QI, will participate, or 4 employees in total. The senior manager hourly labor rate ($75.53) was used to estimate the labor rate for all employees involved in the IMT exercise. In addition, travel may be required to support this exercise, and PHMSA estimates $500 per participant from the railroad to cover travel and lodging costs for the exercise.[68] A representative from the OSRO, or a contractor that may have been used to develop the plan, may also participate or help facilitate the exercise. PHMSA estimates that a contractor or an OSRO may include an additional fee to participate in the exercise. For purposes of this analysis, PHMSA assumes that such a fee will be $1,500 per year for each railroad subject to the rulemaking. This fee estimate is similar to what was included in the USCG final regulatory evaluation referenced above, and is also consistent with information received from PHMSA's discussion with emergency response providers. See Appendix E in the preliminary RIA for more information.

Third, the equipment deployment exercise is conducted annually and ensures that the response equipment is appropriate for the operating environment in which it is intended to be used and that operating personnel are trained in its operation. This exercise involves personnel who would normally operate or supervise the operation of the equipment. In addition, plan holders are responsible for ensuring that all equipment types cited in their respective plan are exercised, whether the equipment is owned and operated by the plan holder or supplied through an OSRO. According to the PREP guidelines, it is not necessary to deploy every piece of each type of

[67] Nontank Vessel Response Plans and Other Vessel Response Plan Requirements – Final Regulatory Analysis and Final Regulatory Flexibility Analysis for the Final Rule. *USCG-2008-1070*, May 2013. Retrieved from http://www.regulations.gov/#!documentDetail;D=USCG-2008-1070-0046

[68] This assumes $300 for travel costs and $200 for 1 night of lodging and incidentals per participant.

equipment as long as all equipment is included in a periodic inspection and maintenance program intended to ensure that the equipment remains in good working order.[69]

For purposes of this analysis, PHMSA assumes that the equipment deployment exercise will involve two senior managers from each covered railroad that will spend 8 hours preparing for the exercise and 8 hours participating in the exercise. The hourly labor rate used for the senior manager is $75.53. In addition, PHMSA assumes that approximately eight engineering staff members from the covered railroad will participate in the 8-hour equipment deployment exercise. The hourly labor rate used to estimate the cost for the railroad staff is $46.86. This labor rate is based on the median wage estimate ($29.62) from the BLS *Occupational Employment and Wages, May 2016* for the wage series "53-4099 Rail Transportation Workers, all other."[70] PHMSA inflated this wage by 56 percent to account for fringe benefits, and adjusted the wage for 2018 and subsequent years in this analysis based on a 1.10-percent annual growth rate in median real wages.

Travel also may be required to support this exercise, and PHMSA assumes $500 per participant from the railroad will be incurred to cover travel and lodging costs for the exercise. Finally, PHMSA assumes that there will be an additional $1,500 fee charged by the OSRO to provide materials for the equipment deployment exercise.

Table 11 provides an overview of the costs of the three exercise requirements described in this section by exercise, differentiated by type of exercise.

Table 11. Estimated Exercise Costs per Railroad per Exercise

Type of Exercise	Managers/QI			Engineering Staff			Other Costs		Total Cost per Railroad per Exercise
	Number of Managers	Hours per Manager	Labor Rate	Number of Staff	Hours per Staff	Labor Rate	Travel Cost	OSRO Fee	
QI Notification	2	2	$75.53	0	0	$46.86	$0	$0	**$302**
IMT Exercise	4	8	$75.53	0	0	$46.86	$2,000	$1,500	**$5,917**
Equipment Deployment	2	16	$75.53	8	8	$46.86	$5,000	$1,500	**$11,916**

2.2. Information Sharing

Under the final rule, a rail carrier of an HHFT as defined in § 171.8 must provide the following notification to the SERC, TERC, or other appropriate entities delegated by the State in which it operates. Please see the final rule published in the Federal Register for the requirements codified. We summarize these requirements here for convenience and analytical purposes only.

For purposes of this analysis, PHMSA divided the costs for this requirement into two sections: (1) notification and development, and (2) periodic updates and submission. We did not receive public comment concerning the information sharing estimates. Aside from accommodating more recent

[69] https://www.bsee.gov/sites/bsee_prod.opengov.ibmcloud.com/files/final_2016_prep_guidelines.pdf (pg. 2-5)
[70] Bureau of Labor Statistics. *Occupational Employment and Wages, May 2016; Wage Series 53-4099 Rail Transportation Workers, all other.* Retrieved from: http://www.bls.gov/oes/current/oes534099.htm

data on salaries, our methods for generating the information sharing estimates remain the same as in the NPRM.

2.2.1. Notification Development

The information required to be shared must consist of the following:

- A reasonable estimate of the number of HHFTs that the railroad expects to operate each week, through each county within the State or through each tribal jurisdiction;
- The routes over which the HHFTs will operate;
- A description of the hazardous material being transported and all applicable emergency response information required by subparts C and G of part 172 of this subchapter;
- HHFT point of contact: at least one point of contact at the railroad (including name, title, phone number and address) related to the railroad's transportation of affected trains;
- If a route is additionally subject to the comprehensive spill plan requirements, the notification must include a description of the response zones (including counties and states) and contact information for the qualified individual and alternate, as specified under section 130.104(a); and
- Each point of contact must be clearly identified by name or title and role (e.g. qualified individual, HHFT point of contact) in association with the telephone number. One point of contact may fulfill multiple roles.

As discussed in Section 1.4.2 of this document, PHMSA estimates that 131 Class II and Class III railroads would be subject to this requirement. Recall that 40 additional railroads, including all of the Class I railroads, have already developed similar notifications, so the development costs for these railroads were attributed to the Emergency Order, and not this final rule.

The provisions included in this final rule are fundamentally similar to those required under the Emergency Restriction/Prohibition Order in Docket No. DOT-OST-2014-0067 (Order).[71] Therefore, for purposes of developing an estimate for the cost associated with this provision, PHMSA used the same burden estimate developed for the ICR supporting statement for this Emergency Order.[72] This supporting statement estimated that it will take approximately 30 hours to complete each notification and send it to the appropriate SERC. In addition, the supporting statement includes an assumption that each railroad subject to the requirement will develop approximately 2.5 notifications.

Applying these estimates to the universe of affected entities for this final rule, PHMSA assumes that approximately 328 notifications will be developed (2.5 x 131). PHMSA assumes that the notification will be completed by a senior employee or manager, and uses a salary estimate of $75.53.

[71] http://www.dot.gov/briefing-room/emergency-order.
[72] "Information Collection Supporting Statement Secretary's Emergency Order Docket No. DOT-OST-2014-0067" OMB Control No. 2130-0604. http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201405-2130-003

Based on 30 hours per notification, the total cost associated with this provision is estimated to be $742,087 ($75.53/hour × 30 hours/notification × 327.5 notifications). In addition to sending the notification to the appropriate SERC, railroads will also have to send the notification to the appropriate TERC, as applicable. PHMSA assumes, however, that this addition will require minimal additional burden and maintains the 30-hour estimate developed for the Emergency Order.

2.2.2. Periodic Updates and Submission

In addition to the development of the notifications, railroads subject to the requirement must also:

- Update the notifications for changes in volume greater than 25 percent.
- Notifications and updates may be transmitted electronically or by hard copy.
- Copies of HHFT notifications made must be made available to the Department of Transportation upon request.

PHMSA estimates that 171 Class II and Class III railroads would be subject to these requirements. As with notification development, PHMSA evaluated burden estimates used in the Emergency Order (EO) supporting statement to estimate the costs associated with these information-sharing provisions.[73]

For submission to DOT, the supporting statement estimates that approximately 8.33 percent of the notifications would be subject to a request from DOT annually and that each request would require 1 hour of the railroad's time per submission. PHMSA assumes that this action would be carried out by a senior staff member or manager, and uses a $75.53 salary estimate. PHMSA estimates that there will be approximately 428 notifications (171 railroads × 2.5 notifications) and that 36 of those notifications will be requested by DOT each year (8.33 percent × 428 notifications). Based on these assumptions, the annual cost for notification submissions to DOT would be $2,691 ($75.53/hour × 1 hour × 36 notifications). The per-railroad cost calculation for submission to DOT is somewhat abstract, but it would be approximately 0.21 notifications per railroad (8.33 percent x 2.5 notifications = 0.21), meaning the per railroad annual cost would be approximately $15.73, or $16.

The requirement in the Emergency Order for the railroad to update the notification, if the railroad materially changed—defined as any increase or decrease of 25 percent or more—the estimated volumes per week or frequencies of trains per week traveling through local communities, was adopted in the rulemaking. The estimate for this provision was 4 hours per update in the E.O. However, PHMSA assumes that the periodic updates will not require as much time as the updates required by the EO. For purposes of this analysis, PHMSA assumes that the periodic update will require 1 hour of a senior employee's or manager's time per month. To further evaluate this assumption, PHMSA included an alternative estimate in Section 2.4.2, "Sensitivity Analysis," using the 4-hour estimate from the EO. It is uncertain how often an affected railroad would need to update their notification, but we assume that each affected railroad would need to do so on a monthly basis. This is an upper-bound estimation of the cost impact for this aspect of the

[73] "Information Collection Supporting Statement Secretary's Emergency Order Docket No. DOT-OST-2014-0067" OMB Control No. 2130-0604. http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201405-2130-003

provision; many affected railroads may need to update less frequently, if their crude-by-rail volumes do not change often.

Based on an estimate of 1 hour per update, and an assumption of one update per month, the monthly cost for updates will be $32,289 (427.5 notifications × 1 hour/notification × $75.53/hour). PHMSA assumes that the first year of the analysis would require 11 updates, and future years would require 12 updates per year.

Table 12 provides an overview of the notification development, submission, and update costs per railroad.

Table 12. Year 1 and Years 2–10 Average Costs per Railroad for Information Sharing

Year	Requirement	Railroads Affected	Unit Cost Per Railroad	Total Cost per Railroad	Total Cost, All Railroads
Year 1	Development	131	$5,665	$7,758*	$1,099,959
	Updates	171	$2,077		
	Submission to DOT	171	$16		
Years 2–10 Average	Updates	171	$2,266	$2,365	$404,440
	Submission to DOT	171	$16		

*For example, the initial annual development cost for information sharing per railroad is estimated at $5,665 = 30 hours/notification × 2.5 notifications × $75.53/hour. The initial annual cost with monthly updates is estimated at $2,077 = 2.5 notifications × 1 hour/notification/month × $75.53/hour × 11 months. Thus, the total initial annual cost per railroad is estimated at $7,758 = $5,665 + $2,077 + $16.

2.2.3. Cost to the Federal Government

The final rule would require railroads to submit their OSRPs to PHMSA for review and approval. In addition, any significant changes to the plan also would have to be submitted to PHMSA. Specifically, under the final rule, railroads would be required to update their plan to address new or different conditions or information, and each railroad must review its plan in full at least every 5 years from the date of the last approval. If new or different operating conditions or information would substantially affect the implementation of the response plan, the railroad must immediately modify its plan to address such a change and must submit the change to PHMSA within 90 days. While it is likely that not all railroads will need to submit an updated plan to PHMSA after each review period, PHMSA does not have information available to estimate the likelihood and timing of updates requiring a submission. PHMSA assumes the review and approval of these plans would require four full-time employees (FTE) after the initial plan submission (year 1) for railroads subject to the OSRP requirement. In addition, 1 FTE would be required in the remaining years (years 2-10, of this analysis) for the review of the updated plans submitted by the railroads.

For estimating the incremental costs of the review and approval of the ORSPs, PHMSA used annual wage data from the Office of Personnel Management (OPM) to estimate wages for its staff at the 2017 General Schedule (GS) level 14, step 1, wage class for the Washington-Baltimore-Northern Virginia metropolitan area.[74] In accordance with the OMB Circular No. A-76 (M-07-02;

[74] U.S. Office of Personnel Management. (2015). "2015 General Schedule (GS) Locality Pay Tables."

2006), PHMSA included a load factor of 36.45 percent for the Federal wage to account for fringe benefits.[75] Finally, the Agency projected the wage forward using a 1-percent wage growth rate.

Table 13 presents an overview of the total cost to the Federal Government for the review and approval of the OSRPs. The undiscounted total cost to the Federal Government is estimated to be $2,053,943 for the 10-year period evaluated in this analysis. Using a 3-percent discount rate, the total cost to the Federal Government is estimated to be $1,858,170, and using a 7-percent discount rate, the total cost is estimated to be $1,653,464.

Table 13. Total Cost to Federal Government for Plan Review and Approval (undiscounted)

Year	Number of FTE	Salary + Fringe and Overhead	Total Cost
1	4	$153,973	$615,891
2	1	$155,104	$155,104
3	1	$156,247	$156,247
4	1	$157,401	$157,401
5	1	$158,567	$158,567
6	1	$159,744	$159,744
7	1	$160,933	$160,933
8	1	$162,134	$162,134
9	1	$163,347	$163,347
10	1	$164,573	$164,573
Total			**$2,053,943**

2.2.4. Information Sharing

The rule would require railroads to submit their notifications to DOT upon request. FRA estimated in the ICR supporting for the Emergency Restriction/Prohibition Order in Docket No. DOT-OST-2014-0067[76] that the review of each notification would require 1 hour of a GS-12, step 5 employee's time.[77]

PHMSA used hourly wage data from the Office of Personnel Management to estimate wages for its staff at the 2017 GS level 12, step 5, using the wage class for the Washington-Baltimore-Northern Virginia metropolitan area.[78] We converted this salary to an hourly wage, and estimated an hourly wage. In accordance with the revised OMB A-76 (M-07-02; 2006), PHMSA included

Washington, DC. Retrieved from https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2017/DCB_h.pdf

[75] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2007/m07-02.pdf

[76] http://www.dot.gov/briefing-room/emergency-order.

[77] "Information Collection Supporting Statement, Secretary's Emergency Order Docket No. DOT-OST-2014-0067" OMB Control No. 2130-0604. http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201405-2130-003

[78] U.S. Office of Personnel Management. (2015). "2015 General Schedule (GS) Locality Pay Tables." Washington, DC. Retrieved from: https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2017/DCB_h.pdf

a load factor of 36.45 percent for the Federal wage to account for fringe benefits.[79] Finally, the Agency projected the wage forward using a 1-percent wage growth rate.

Table 14 presents an overview of the total cost to the Federal Government for the review of notifications. The undiscounted total cost to the Federal Government is estimated to be $22,148 for the 10-year period evaluated in this analysis. Using a 3-percent discount rate, the total cost to the Federal Government is estimated to be $19,425, and using a 7-percent discount rate, the total cost is estimated to be $16,577.

Table 14. Total Cost to Federal Government for Review of Notifications (undiscounted)

Year	Hourly Salary (GS-12, step 5)	Number of Notifications	Annual Total
1	$59.50	36	$2,142
2	$59.94	36	$2,158
3	$60.38	36	$2,174
4	$60.83	36	$2,190
5	$61.28	36	$2,206
6	$61.73	36	$2,222
7	$62.19	36	$2,239
8	$62.66	36	$2,256
9	$63.12	36	$2,272
10	$63.60	36	$2,290
Total		**360**	**$22,148**

Over the 10-year period, costs to the Federal government for both OSRPs and information sharing are estimated to total approximately $2,076,091. The costs to the Federal government for the approval of OSRPs and review of information sharing notifications are also reflected in the "Total Costs" section of this document.

2.3. Total Costs

Based on the cost components described in sections 2.1 and 2.2, PHMSA estimates that the undiscounted total cost over the 10-year period for this rule would be $32.3 million. Using a discount rate of 3 percent, the total cost would be $28.9 million, and using a discount rate of 7 percent, the total cost would be $25.2 million.

Table 15 provides a summary of the total estimated costs associated with the final rule by railroad class, including the undiscounted and discounted (3 percent and 7 percent) 10-year and annualized costs.

[79] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2007/m07-02.pdf

Table 15. Summary of Undiscounted and Discounted Total and Annualized Costs (millions)

Class of Railroad	Undiscounted		3% Discount Rate		7% Discount Rate	
	10-Year	Annualized	10-Year	Annualized	10-Year	Annualized
Oil Spill Response Plans						
Class I	$6.30	$0.6	$5.6	$0.7	$4.9	$0.7
Class II	$4.0	$0.4	$3.6	$0.4	$3.1	$0.4
Class III	$15.2	$1.5	$13.5	$1.6	$11.8	$1.7
Information Sharing						
All Railroads	$4.7	$0.5	$4.2	$0.5	$3.7	$0.5
Cost to Government						
Government Costs	$2.1	$0.2	$1.9	$0.2	$1.7	$0.2
Total	$32.3	$3.2	$28.9	$3.4	$25.2	$3.6

Table 16 provides a summary of the annualized costs, using a 7-percent discount rate only, differentiated by each of the provisions evaluated and by railroad class.

Table 16. Summary of Annualized Costs by Provision (7% Discount Rate)

Category	Class of Railroad	Annualized Cost (7%)
Plan Development	Class I	$115,555
	Class II	$60,529
	Class III	$201,763
Plan Maintenance	Class I	$65,243
	Class II	$34,175
	Class III	$113,916
Plan Submission	Class I	$37
	Class II	$58
	Class III	$289
OSRO Fee	Class I	$299,600
	Class II	$70,620
	Class III	$147,125
Training and Exercises	Class I	$221,364
	Class II	$282,035
	Class III	$1,212,707
Information Sharing	All Railroads	$530,567

As discussed in Section 1.6, PHMSA evaluated the impacts of this rulemaking over a 10-year period. Table 17 provides an overview of the undiscounted costs for the private entities that would be affected by the final rule over the 10-year period for each provision included in this analysis.

Table 17. Summary of 10-Year Costs by Provision (undiscounted) (millions)

Year	Plan Development	Plan Maintenance	Plan Submission	OSRO Fees	Training and Exercises	Information Sharing	Cost to Government	Total
1	$1.9	$0.2	$0.0	$0.5	$2.5	$1.1	$0.6	$6.8
2	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
3	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
4	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
5	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
6	$1.0	$0.2	$0.0	$0.5	$2.5	$0.4	$0.2	$4.8
7	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
8	$0.0	$0.2	$0.0	$0.5	$1.4	$0.4	$0.2	$2.6
9	$0.0	$0.2	$0.0	$0.5	$1.4	$0.4	$0.2	$2.6
10	$0.0	$0.2	$0.0	$0.5	$1.4	$0.4	$0.2	$2.6

Table 18 provides an overview of the undiscounted cost for each cost category evaluated in this analysis, differentiated by class of railroad.

Table 18. Undiscounted Unit Cost per Railroad by Railroad Class

Category	Outlay Period	Class of Railroad	Unit Cost Per Railroad
Plan Development	Year 1	Class I	$84,666*
		Class II	$28,222*
		Class III	$18,815*
Plan Maintenance	Annual	Class I	$8,745
		Class II	$2,915
		Class III	$1,943
Plan Submission	Once every 5 years	Class I	$21
		Class II	$21
		Class III	$21
OSRO Fee	Annual	Class I	$40,000
		Class II	$6,000
		Class III	$2,500
Training and Exercises	Year 1	Class I	$66,475**
		Class II	$42,305**
		Class III	$27,803**
Information Sharing	Year 1	All Railroads	$7,758
	Annual	All Railroads	$2,365

*This cost represents the plan development cost per railroad in the implementation year (year 1). The final rule requires each railroad to review its plan at least every 5 years from the date of the last approval. PHMSA estimates the recurring burden with reviewing the initial plan is half of the burden needed to develop the initial plan development cost.

**This cost represents training and exercise costs in the implementation year (year 1). Subsequent years have different costs due to different frequencies applicable to the training/exercise requirements.

2.4. Cost Uncertainty and Sensitivity Analysis

2.4.1. Cost Uncertainty

In previous sections, we presented the estimated costs of the various provisions required in this rulemaking. It is important to note areas where there are uncertainties regarding the cost estimates, and where costs may be over- or underestimated. Table 19 below presents some areas where cost uncertainties exist and whether the estimates used by PHMSA are likely to result in overestimation or underestimation of costs.

Table 19. Cost Uncertainties – Plan Development, Maintenance, OSRO Fees, Training, and Exercises

Cost Area	Direction of Uncertainty			Brief Explanation of Cause of Uncertainty
	Underestimation	Overestimation	Unknown	
Plan Development			X	The Agency believes it is likely that many of the railroads that would be subject to the final rule, particularly Class I and Class II railroads, have already developed response plans that include similar provisions to what is included in the comprehensive plans. These railroads would only need to update their plans to be consistent with the requirements and may not require the entire time estimated for plan development. However, AAR/ASLRRA submitted a comment to the ANPRM suggesting that the plan development costs would be higher than PHMSA estimated in the preliminary RIA. Also, AAR and API indicated in comments to the NPRM that plan development costs were underestimated in the preliminary RIA. PHMSA revised our estimates upwards in the final RIA, despite the lack of data submitted in support of these commenters' claims. Since there are reasons indicating both under- and overestimation of plan development costs, we ultimately note "Unknown" for this cost area.
Plan Maintenance			X	The Agency assumes that railroads will have to make revisions to their plans annually. However, revisions are only necessary if there are different conditions or new information applicable to the plan, so there may be several railroads that do not need to update their plans on an annual basis. API indicated that the costs to review plans annually may be higher than estimated in the preliminary RIA. PHMSA revised our estimate upwards in response. Nevertheless, based on the factors identified, it is not known whether annual COSRP maintenance will be higher or lower than estimated in the final RIA.
OSRO Fees		X		The Agency has limited information on the retainer fees railroads may incur to contract with an OSRO. To be conservative, the Agency estimated that all railroads subject to the plan would need an annual retainer fee even though we believe many railroads, particularly Class I railroads, already have agreements in place with spill response providers; however, there is uncertainty over the potential need for and cost of new agreements. Retainer fees may not be needed at all in some cases, as some OSROs may be willing to contract with a plan holder (railroad) simply on the basis that their services will be solicited for future spills. Additionally, the costs of existing contracts / agreements cannot be attributed to this final rule. We did not receive public comment to the NPRM concerning our preliminary estimates. For these reasons, we believe the OSRO fee costs are overestimated.

Cost Area	Direction of Uncertainty			Brief Explanation of Cause of Uncertainty
	Underestimation	Overestimation	Unknown	
Training and Exercises	X			The Agency has limited information on the number and types of employees that will require training as a result of the final rule and the amount of time that training will require. The railroad has discretion on how they want to administer the training requirements, and the Agency believes it is likely that the response plan training will be incorporated into other existing training requirements (e.g., Subpart H of Part 172—Training). Further, other Federal agencies may offer training funding for which oil spill response training may qualify. Nevertheless, if a new training regime needs to be developed, it may take longer than the estimated 8 hours per employee considered in this analysis. API, in particular, noted in public comment that training costs may be underestimated. However, we did not receive data with which to revise our training costs estimates. We acknowledge training costs might possibly be underestimated.
Total Cost		X		Several States have current or pending legislation or regulatory requirements related to oil spill response planning for railroads. The Agency has limited information on current compliance with these State requirements, but believes there will likely be overlap between what is required at the State and Federal levels. Therefore, the Agency believes several railroads may already be in compliance with some or part of the comprehensive requirements based on State regulation, and will not be subject to all of the costs included in this analysis. Further, many railroads have voluntarily implemented oil spill response plans, and the costs of implementing voluntary programs cannot be attributed to this rule. In the absence of rulemaking, many railroads are proactively preparing for oil spills and seeking ways to improve their spill preparedness and response.

2.4.2. Sensitivity Analysis

To evaluate some of the cost uncertainties mentioned above, PHMSA conducted sensitivity analyses on key input variables used in this analysis, and provided updated estimates for the total cost of the rule. In Table 26 at the end of this section, PHMSA provides an overview of the low, medium/selected, and high estimates.

2.4.2.1. OSRO Fees – Class III Railroads

As part of the evaluation of OSRO retainer fees, PHMSA has some examples of a "zero retainer fee" policy for OSRO services.[80,81] For example, in the survey conducted with OSROs in development of the NPRM and preliminary RIA, one company said that they would likely not charge a retainer fee for Class III railroads.[82] For this sensitivity analysis, PHMSA adjusted the retainer fees for Class III railroads from $2,500 to $0. Table 20 presents the revised undiscounted costs by provision, and Table 21 presents the revised undiscounted costs by railroad class. This adjustment would decrease the total costs to Class III railroads by $1,375,000 over the 10-year period of this analysis.

Table 20. Total Undiscounted Costs by Provision with Adjusted Class III OSRO Fee (millions)

Year	Plan Development	Plan Maintenance	Plan Submission	OSRO Fees	Training, Exercises, and Drills	Information Sharing	Cost to Goverment	Total
1	$1.9	$0.2	$0.0	$0.3	$2.5	$1.1	$0.6	$6.7
2	$0.0	$0.2	$0.0	$0.3	$1.3	$0.4	$0.2	$2.4
3	$0.0	$0.2	$0.0	$0.3	$1.3	$0.4	$0.2	$2.4
4	$0.0	$0.2	$0.0	$0.3	$1.3	$0.4	$0.2	$2.4
5	$0.0	$0.2	$0.0	$0.3	$1.3	$0.4	$0.2	$2.4
6	$1.0	$0.2	$0.0	$0.3	$2.5	$0.4	$0.2	$4.6
7	$0.0	$0.2	$0.0	$0.3	$1.3	$0.4	$0.2	$2.5
8	$0.0	$0.2	$0.0	$0.3	$1.4	$0.4	$0.2	$2.5
9	$0.0	$0.2	$0.0	$0.3	$1.4	$0.4	$0.2	$2.5
10	$0.0	$0.2	$0.0	$0.3	$1.4	$0.4	$0.2	$2.5

Table 21. Total Undiscounted Costs by Railroad Class with Adjusted Class III OSRO Fee (millions)

Year	OSRPs			Information Sharing	Costs to Government	Total
	Class I	Class II	Class III	All Railroads		
1	$1.4	$0.9	$2.7	$1.1	$0.6	$6.7
2	$0.5	$0.3	$1.1	$0.4	$0.2	$2.4

[80] For an example, see: http://petrochemrecovery.com/Emergency-Spill-Response-Management.html
[81] Also see the preliminary RIA, Appendix E, question 5a.
[82] Ibid.

Year	OSRPs			Information Sharing	Costs to Government	Total
	Class I	Class II	Class III	All Railroads		
3	$0.5	$0.3	$1.1	$0.4	$0.2	$2.4
4	$0.5	$0.3	$1.1	$0.4	$0.2	$2.4
5	$0.5	$0.3	$1.1	$0.4	$0.2	$2.4
6	$1.1	$0.7	$2.2	$0.4	$0.2	$4.6
7	$0.5	$0.3	$1.1	$0.4	$0.2	$2.5
8	$0.5	$0.3	$1.1	$0.4	$0.2	$2.5
9	$0.5	$0.3	$1.1	$0.4	$0.2	$2.5
10	$0.5	$0.3	$1.1	$0.4	$0.2	$2.5

2.4.2.2. Training Requirements

The final rule would require all employees subject to the plan to receive initial training to ensure that the applicable employees know their responsibilities under the plan, the plan content, and the notification procedures. This training must be conducted at least once every 5 years. PHMSA estimated this training would take 8 hours per employee in years 1, 5 and 10. However, subject matter experts at FRA suggested that this requirement may take up to 40 hours to complete. To evaluate that possibility, PHMSA adjusted the hours of training from 8 hours to 40 hours per applicable employee. Table 22 provides an overview of the revised undiscounted cost estimate by provision, and Table 23 provides an overview of the revised undiscounted costs by railroad class. Under this scenario, the total costs would increase by $9,252,873 over the 10-year period of this analysis.

Table 22. Total Undiscounted Costs by Provision with Adjusted Training Hours (millions)

Year	Plan Development	Plan Maintenance	Plan Submission	OSRO Fees	Training and Exercises	Information Sharing	Cost to Government	Total
1	$1.9	$0.2	$0.0	$0.5	$7.0	$1.1	$0.6	$11.3
2	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
3	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
4	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
5	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
6	$1.0	$0.2	$0.0	$0.5	$7.2	$0.4	$0.2	$9.5
7	$0.0	$0.2	$0.0	$0.5	$1.3	$0.4	$0.2	$2.6
8	$0.0	$0.2	$0.0	$0.5	$1.4	$0.4	$0.2	$2.7
9	$0.0	$0.2	$0.0	$0.5	$1.4	$0.4	$0.2	$2.7
10	$0.0	$0.2	$0.0	$0.5	$1.4	$0.4	$0.2	$2.7

In addition, total costs for Class I railroads would increase by $2,756,175, Class II would increase by $2,165,566, and Class III would increase by $4,331,132 over the 10-year period of this analysis.

Table 23. Total Undiscounted Costs by Railroad Class with Adjusted Training Hours (millions)

Year	Oil Spill Response Plans			Information Sharing	Cost to Government	Total
	Class I	Class II	Class III	All Railroads		
1	$2.8	$1.9	$4.9	$1.1	$0.6	$11.3
2	$0.5	$0.3	$1.2	$0.4	$0.2	$2.6
3	$0.5	$0.3	$1.2	$0.4	$0.2	$2.6
4	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
5	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
6	$2.5	$1.8	$4.6	$0.4	$0.2	$9.5
7	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
8	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
9	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6
10	$0.5	$0.3	$1.3	$0.4	$0.2	$2.6

2.4.2.3. Periodic Notifications

The final rule would require railroads to update their notifications when changes in volume are greater than 25 percent. This aligns with the Emergency Order supporting statement.[83] The Emergency Order included a requirement to update the notification if the railroad made any material changes—defined as any increase or decrease of 25 percent or more—in the estimated volumes per week or frequencies of trains per week traveling through local communities. While the final rule only requires an update when changes in volume are greater than 25 percent, for purposes of the analysis, we estimate that affected railroads would develop updates on a monthly basis. As such, it is an upper-bound approximation of the potential costs that affected railroads would face to update their information sharing notifications to SERCs, etc. The estimate for this part of the information sharing provision was 4 hours per update in the E.O. supporting statement. In our primary estimate for this analysis, we used 1 hour per notification. To address this difference, we offer a sensitivity analysis showing the expected increase in costs if each update required 4 hours, rather than 1 hour.

For this sensitivity analysis, PHMSA adjusted the estimate from 1 hour to 4 hours per notification per railroad. Table 24 provides an overview of the revised undiscounted costs by provision, and Table 25 provides an overview of the revised undiscounted costs by railroad class. Under this scenario, the total cost would increase by $11,910,117 over the 10-year period of this analysis.

[83] "Information Collection Supporting Statement Secretary's Emergency Order Docket No. DOT-OST-2014-0067" OMB Control No. 2130-0604. http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201405-2130-003

Table 24. Total Undiscounted Costs by Provision with Adjusted Periodic Notifications (millions)

Year	Plan Development	Plan Maintenance	Plan Submission	OSRO Fees	Training / Exercises	Information Sharing	Cost to Government	Total
1	$1.9	$0.2	$0.0	$0.5	$2.5	$2.2	$0.6	$7.2
2	$0.0	$0.2	$0.0	$0.5	$1.3	$1.6	$0.2	$3.6
3	$0.0	$0.2	$0.0	$0.5	$1.3	$1.6	$0.2	$3.6
4	$0.0	$0.2	$0.0	$0.5	$1.3	$1.6	$0.2	$3.6
5	$0.0	$0.2	$0.0	$0.5	$1.3	$1.6	$0.2	$3.6
6	$1.0	$0.2	$0.0	$0.5	$2.5	$1.6	$0.2	$5.8
7	$0.0	$0.2	$0.0	$0.5	$1.3	$1.6	$0.2	$3.7
8	$0.0	$0.2	$0.0	$0.5	$1.4	$1.6	$0.2	$3.7
9	$0.0	$0.2	$0.0	$0.5	$1.4	$1.6	$0.2	$3.7
10	$0.0	$0.2	$0.0	$0.5	$1.4	$1.7	$0.2	$3.7

Table 25. Total Undiscounted Costs by Railroad Class with Adjusted Periodic Notifications (millions)

Year	Oil Spill Response Plans			Information Sharing	Costs to Government	Total
	Class I	Class II	Class III	All Railroads		
1	$1.4	$0.9	$2.8	$2.2	$0.6	$7.2
2	$0.5	$0.3	$1.2	$1.6	$0.2	$3.6
3	$0.5	$0.3	$1.2	$1.6	$0.2	$3.6
4	$0.5	$0.3	$1.3	$1.6	$0.2	$3.6
5	$0.5	$0.3	$1.3	$1.6	$0.2	$3.6
6	$1.1	$0.7	$2.3	$1.6	$0.2	$5.8
7	$0.5	$0.3	$1.3	$1.6	$0.2	$3.7
8	$0.5	$0.3	$1.3	$1.6	$0.2	$3.7
9	$0.5	$0.3	$1.3	$1.6	$0.2	$3.7
10	$0.5	$0.3	$1.3	$1.7	$0.2	$3.7

2.4.2.4. Combined Results

Table 26 provides a summary of the sensitivity analysis, including the undiscounted 10-year total and annualized cost by railroad class. The "low scenario" is the total cost including the downward adjustment of the OSRO fees for Class III railroads. The "medium scenario" is the total cost using the primary estimate described in the RIA, and finally the "high scenario" is the total cost including the upward adjustments for the hours of training and information sharing updates.

Table 26. Combined Results: Undiscounted Total Costs under High, Medium, and Low Scenarios (millions)

Class of Railroad	Low Scenario		Medium Scenario		High Scenario	
	10 Year Total (3%)	10 Year Total (7%)	10 Year Total (3%)	10 Year Total (7%)	10 Year Total (3%)	10 Year Total (7%)
Oil Spill Response Plans						
Class I	$5.6	$4.9	$5.6	$4.9	$8.2	$7.3
Class II	$3.6	$3.1	$3.6	$3.1	$5.6	$5.0
Class III	$12.3	$10.7	$13.5	$11.8	$17.6	$15.5
Information Sharing						
All Railroads	$4.2	$3.7	$4.2	$3.7	$14.7	$12.6
Costs To Government						
Federal Government Costs	$1.9	$1.7	$1.9	$1.7	$1.9	$1.7
Total	**$27.7**	**$24.2**	**$28.9**	**$25.2**	**$47.9**	**$42.0**

3. Benefits

The OSRP requirements are designed to reduce the magnitude and severity of spills and improve spill response, thereby reducing the environmental and other damages that spills may cause. PHMSA faced data uncertainties that limited our ability to estimate, quantitatively, the benefits of the final rule. This has been a continual challenge for PHMSA's analysis of this rule, such that in the preliminary RIA, PHMSA asked, "Are there quantifiable benefits to the proposed rule that PHMSA has not identified? Can these benefits be monetized? How so?"[84] After reviewing public comment, we did not receive any new input on this issue, specifically new quantitative methods or data to explore. As such, PHMSA has updated our breakeven analysis to identify the number of gallons of oil that the final rule would need to prevent from being spilled in order for the final rule's benefits to at least equal its estimated costs. The breakeven analysis assumes the average social cost of each gallon spilled is $218.[85] We explain the choice of this value for the cost per gallon spilled in greater detail in the HM-251 RIA and preliminary RIA for the NPRM preceding this final rule.[86] Additional benefits may also be incurred due to ecological and human health improvements that may not be captured in the value of the avoided cost of spilled oil. These benefits, which are difficult to quantify, are discussed further in Section 3.3 on a qualitative basis.

3.1. Baseline and Assumptions for Benefits Assessment

3.1.1. Baseline Incidents

To assess the baseline conditions that would be affected by the final rule, PHMSA evaluated data provided in the Hazardous Material Incident Report Database.[87] Specifically, PHMSA evaluated reported incidents that occurred in the United States from 2009–2017 involving liquid petroleum transported by rail, and filtered them for only those incidents that likely involved HHFTs and occurred on mainline track.

Figure 3 provides a count of the number of rail incidents involving liquid petroleum reported each year from 2009 to 2016, along with crude oil carload volume for those years (2017 Waybill data are not yet available).

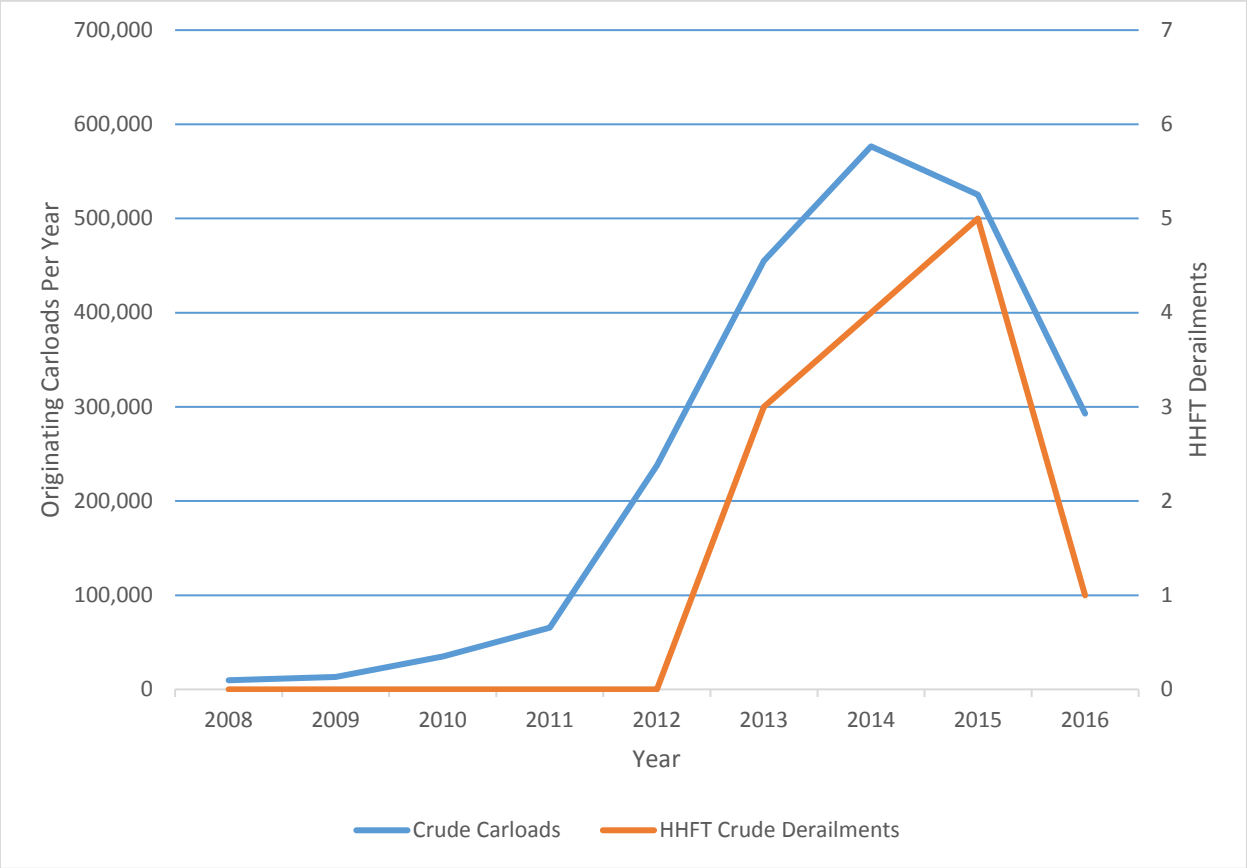
[84] See preliminary HM-251B RIA, pg. 90

[85] Adjusted from $211 in June of 2015 to December 2017 dollars (the latest available) using the BLS CPI inflation calculator, which can be found at https://data.bls.gov/cgi-bin/cpicalc.pl?cost1=25000&year1=198601&year2=201703

[86] Final Regulatory Impact Analysis (RIA) – Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains, Pipeline and Hazardous Materials Safety Administration (PHMSA), May 2015, available at: https://www.regulations.gov/document?D=PHMSA-2012-0082-3442

[87] PHMSA Office of Hazardous Materials (OHMS) Incident Reports Database Search, available at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx

Figure 3. Carloads of Crude Oil Shipped and Rail Accidents (Derailments), 2000–2016



Sources and notes: Originating Class I Carloads for 2000–2016 obtained from the Surface Transportation Board Waybill sample. Derailments are from the PHMSA and FRA Incident Report Databases and include derailments that are not summarized in the RIA's Appendix B.

A comprehensive OSRP would be required to cover those routes/railroads that haul HHFTs carrying petroleum oil. We restrict our consideration of baseline societal damages that might be mitigated by the final rule to those incidents involving petroleum oil HHFTs. The Agency has identified 15 such incidents from 2012 through 2017. These events are presented in the Table 27 below.

Table 27. Petroleum Oil HHFT Derailments, 2012–2017

Year	Nearest Town	State	Quantity Released
2013	Parkers Prairie	MN	15,000
2013	Aliceville	AL	455,520
2013	Casselton	ND	474,936
2014	New Augusta	MS	50,350
2014	Vandergrift	PA	9,800
2014	Lynchburg	VA	30,000
2014	Evans	CO	7,932

2015	Galena	IL	110,543
2015	Mount Carbon	WV	362,349
2015	Heimdal	ND	98,090
2015	Culbertson	MT	27,201
2015	Watertown	WI	1,000
2016	Mosier	OR	42,448
2017	Money	MS	24,653
2017	Plainfield	IL	28,245

2016 volumes are still slightly higher than the volumes seen in 2012, and EIA predicts U.S. crude oil production volumes to remain high for the next decade and beyond. As a result, we expect volumes going forward to remain relatively high by historic (pre-2012) standards.

3.1.2. Event Forecasting

One simple way to predict the number of future events based on the HHFT period is as follows: The period of high-volume crude shipments starts in 2012 through 2017, providing a 6-year period. We consider a 10-year analysis period going forward, so the analysis period is 1.67 times longer than the observed period. There were 15 incidents in the observed period, so the predicted number of events over the analysis period would be 15 x 1.67 = 25 incidents over 10 years, or 2.5 incidents per year.
The Agency acknowledges that this methodology is somewhat simple, but no adverse comments regarding this methodology, or suggestions for improvement, were provided by comments to the docket. As noted at the NPRM stage, this approach enables consideration of the most recent incidents. Given the wide swings in annual crude oil volumes shipped by rail over the past few years, predicting future volumes is difficult. As a result, an estimate based on a prediction of future volumes, and rates of derailment per unit of volume shipped, would be highly uncertain and prone to significant inaccuracy. This simplified method may therefore produce a forecast as accurate, or more accurate, than a more sophisticated method.

For example, we could base our predicted number of events on known incidents per unit of known volume and apply that to predicted volume. For 2012–2016, there were 13 HHFT derailments observed in 2,087,384 carloads shipped. PHMSA recently produced multiple new carload forecasts due to a FAST Act mandate to revise the HM-251 RIA to incorporate new testing results for the ECP brake provision of that rule. Using the "low" (i.e. lower volume) forecast from that recent assessment, for 2019–2028 (an approximation of the 10-year analysis period), the Agency estimated approximately 4.17 million carloads forecast to be shipped. This represents a significant reduction in forecast volume from the industry-provided forecast used in the 2015 HM-251 final rule, which forecast roughly 9.8 million carloads shipped by rail over the same period. Table 28 provides an overview of the carload estimate per year and the number of HHFT derailments. Carload data are not currently available for 2017, so we calculate the rate of derailment per thousand carloads using 2012-2016. Applying the rate per thousand carloads from the table below (.006227891 derailments per thousand carloads) to the forecast number of carloads to be shipped (4,174.77 thousand) yields an estimated 26 derailments over 10 years. This figure is very close, but slightly above, the figure generated using a per-year average figure, as described above.

Table 28. Number of Derailments and Carloads Estimates

Year	Carload Estimate	HHFT Derailments	Total Volume Spilled (gallons)	Volume Spilled/Carload Shipped
2012	237,932	0	0	0
2013	454,873	3	945,456	2.08
2014	576,581	4	98,082	0.17
2015	525,231	5	599,183	1.14
2016	292,767	1	42,448	.145
Total	2,087,384	13	1,685,169	0.81
Derailments per thousand carloads		0.006227891		

3.1.3. Expected Size of Events

There are fifteen incidents for which data reporting are complete, which we use to generate an average for volume spilled per derailment.[88] The incidents and quantity released are presented in Table 27 above. The 15 incidents produced a total estimated 1,738,067 gallons of product spilled, resulting in an average spill size of 115,871 gallons. This figure is multiplied by the forecasted number of incidents to obtain an estimated total volume spilled for the 10-year analysis period: 115,871 x 25 = 2,896,778 gallons.

Release volumes are strongly correlated with the number of cars hauling hazardous flammable liquids in a train consist – the functional relationship can be easily understood by considering a stylized example. Take a 100-car train that experiences a derailment involving 10 cars, with the probability that any derailed crude oil car will puncture of 50 percent, and a punctured car assumed to release its entire contents. If this train were hauling 20 carloads of crude oil the expected number of crude oil cars that would derail is 2 and one car would puncture and release its entire contents, for an expected release volume of 30,000 gallons. If we consider an identical derailment of a train hauling 40 carloads of crude oil, we would expect 4 of the derailed cars to be hauling crude oil, with a potential 2 cars puncturing and releasing their contents, for a total spill volume of 60,000 gallons. A 10-car derailment involving a 100-car unit train of crude oil would experience 10 derailed cars containing crude oil and 5 cars releasing product, for a total release quantity of 150,000 gallons. As the number of cars hauling crude oil increases, we expect the quantity released to also increase.

Since this final rule addresses worst-case discharges or threats of worst-case discharges, we focus on HHFT incidents, which are expected to be more severe than incidents involving trains hauling smaller quantities of crude oil. The comprehensive OSRP requirements in the final rule apply only to carriers and routes on which trains carrying 20 or more carloads of crude oil in a block or 35 or more total carloads in a train consist. Because carriers and routes on which smaller volumes of

[88] Technically, entities reporting incidents have a year to update spill volumes and other data related to incidents, so 2017 event reporting is not "complete," although we do not expect the data to change significantly with respect to the quantity released.

crude oil are shipped are not necessarily covered under this requirement, we restrict our analysis to the events involving trains that meet this threshold, to ensure that we do not include events that may not be mitigated by the requirements.

Since this rule covers oil spill response requirements, any event that results in no release of product should be ignored when considering societal damages and benefits. In addition, the events that occurred prior to 2012 occurred in a much different environment than those which occurred with the advent of high volume shipments of crude oil by rail. Prior to 2012, the annual carloads of crude oil moved by rail numbered in the tens of thousands. Starting in 2012, crude oil volumes increased markedly varying from more than 100,000 carloads per year to more than half a million. The Agency believes that since the final rule requirements only apply to carriers and routes on which high volumes of crude are moved, considering only those events involving consists hauling relatively high volumes is appropriate. As explained above, these events will likely result in higher volumes spilled.

3.1.4. Cost per Gallon Spilled of Oil

For the purposes of monetizing crude oil HHFT derailments, we continue to use the value used in the HM-251 rule, which was $218 per gallon.[89] The Agency received no adverse comments regarding this monetization figure, which was based on costs reported to the Agency for pipeline spills. For a full explanation of the derivation of this figure, the reader is referred to the HM-251B preliminary RIA and the 2015 HM-251 final rule RIA.

3.1.5. Adjusting for HHFT Rule

The incident data used in this analysis are historical and do not take into account recent revisions to PHMSA's regulations related to enhanced tank car standards and operational controls for HHFTs. This rulemaking was finalized in May 2015 and is under implementation. In December of 2017, PHMSA and FRA released a FAST Act mandated re-assessment of the ECP brake requirement of the HM-251 final rule.[90] As part of this re-assessment, the Agencies re-assessed the fleet composition of both crude and ethanol fleets, produced a new forecast for the quantity of crude and ethanol shipped by rail, and recalculated the effectiveness rates of upgrading flammable liquid tank cars in crude and ethanol service given the current fleet composition. While the 2015 rule is not yet fully in effect, for purposes of establishing a baseline universe of incidents, PHMSA has reduced the estimated average release of liquid petroleum based on the current composition of the crude oil fleet, and yearly effectiveness rates developed using the crude oil tank car figures presented in the recent update to the HM-251 RIA that was conducted due to the aforementioned FAST Act mandate.

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[89] PHMSA developed this figure for the 2015 HM 251 final rule and the NPRM attached to the OSRP rulemaking. At that time the Agency produced an estimate of $211 per gallon. PHMSA updated this figure for inflation by using the BLS CPI inflation calculator set to June 2015 for and adjusted to December of 2017 (the most recent available). This produced a value of $217.97, which was rounded to $218. The BLS inflation calculator can be found online at https://data.bls.gov/cgi-bin/cpicalc.pl?cost1=211.00&year1=201506&year2=201712

[90] See 82 FR 48006 for the Federal Register notice requesting comments on the updated HM-251 RIA, or PHMSA-2017-0102-0014 at www.regulations.gov for a PDF of the updated HM-251 RIA.

Adjustment for current fleet composition is necessary because the crude oil fleet is currently composed of CPC-1232 and DOT-117 tank cars, not unimproved DOT-111 tank cars.[91] All the events presented above from years 2014 and prior involved unimproved DOT-111 tank cars. All the incidents in 2015 and forward involved CPC-1232 tank cars. In order to obtain a baseline expected release quantity given the current fleet composition, we adjust all events that occurred in 2014 and prior by the weighted effectiveness of the crude oil tank car fleet as currently composed compared with a fleet composed of unimproved legacy DOT 111s. This adjustment reduces expected releases based on 2014 and prior year incidents to approximately 66.7 percent of the raw recorded figure. For example, the Casselton, ND derailment is reduced from 474,936 to 316,676 gallons – the expected release rate of the incident given the fleet as currently composed as compared to a fleet composed of legacy DOT 111 cars. That adjustment reduces the adjusted quantity spilled in incidents through 2017 to 1,390,336 gallons (down from 1,738,067) and the average expected release to 92,689 gallons (down from 115,871 gallons). This change effectively reduces the spill size of past events involving DOT 111 legacy cars to the expected spill size for those events assuming they had involved a CPC-1232 or DOT-117 tank car.

Having reduced the expected spill size to account for already realized improvements in the crude oil tank car fleet, we apply the expected yearly improvement by multiplying spill damages by one minus the effectiveness rates presented below. These rates represent the remaining expected tank car fleet upgrades over the course of the HM-251 implementation schedule (given current fleet composition, this is the improvement from converting remaining jacketed and non-jacketed CPC 1232 tank cars to DOT 117R tank cars). Table 29 presents these effectiveness rates by year reflecting the ECP update for the rule as a whole and for crude oil only.[92]

Table 29. Estimated Effectiveness for the HM-251 Final Rule, 2019–2028

Year	Crude Only HHFT Effectiveness Post ECP Repeal
1	18.19%
2	17.35%
3	16.50%
4	15.93%
5	14.46%
6	13.82%
7	13.66%
8	13.37%
9	13.37%
10	13.37%

[91] "Fleet Composition of Rail Tank Cars That Transport Flammable Liquids: 2013-2016," Bureau of Transportation Statistics (BTS), September 2017, available at: https://cms.bts.dot.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/surveys/annual-tank-car-facility-survey/208061/fleet-composition-rail-tank-cars-flammable-liquids-sept-5-2017.pdf [hereinafter "2017 BTS Fleet Report"]

[92] Derivation of these figures is presented on pages 287–291 of the HM-251 RIA.

The percentages in Table 29 represent the percent reduction in severity attributed to the HM-251 rule given the degree of implementation for crude oil transport only. These rates also reflect the retirement of virtually all legacy DOT-111 tank cars from the crude oil fleet over the past 2 years. The crude oil-only figures differ from those for the rule as a whole because cars in crude oil service are on a faster retrofit schedule than those used in ethanol service, and because the crude oil fleet has a significantly different composition compared to the ethanol fleet. Therefore, the specific effectiveness rates improve more quickly for crude by rail than for ethanol. At present, legacy DOT-111s still make up a significant portion of the ethanol fleet, whereas they have virtually disappeared from crude oil service.[93] Because the crude oil fleet has a mix of cars that have a lower probability of release in the event of derailment, the maximum effectiveness rate is lower for crude than for ethanol, because upgrading these better cars to the new standard results in smaller decreases in the probability of release. We subtract the crude oil-specific figures from 1 to calculate percent damages remaining given implementation of the HM-251 rule, and multiply that figure by total societal damages as described above to obtain final baseline damages from which to draw benefits for this final rule. As the Department has announced its intent to repeal the ECP brake provision of the 2015 HM-251 final rule, the effectiveness attributed to ECP brakes has not been considered in these calculations. The total expected damages are presented in Table 30.

Table 30. Estimated Societal Damages from Crude Oil HHFT Derailments (millions)

Year	Events per year	Monetized Value[1]	HHFT Effectiveness	Adjusted Monetized Value	Damages Per Event	Total Estimated Cost of Final Rule
1	2.5	$50.5	18.19%	$41.3	$16.5	$6.8
2	2.5	$50.5	17.35%	$41.7	$16.7	$2.6
3	2.5	$50.5	16.50%	$42.2	$16.9	$2.6
4	2.5	$50.5	15.93%	$42.5	$17.0	$2.6
5	2.5	$50.5	14.46%	$43.2	$17.3	$2.6
6	2.5	$50.5	13.82%	$43.5	$17.4	$4.8
7	2.5	$50.5	13.66%	$43.6	$17.4	$2.6
8	2.5	$50.5	13.37%	$43.8	$17.5	$2.6
9	2.5	$50.5	13.37%	$43.8	$17.5	$2.6
10	2.5	$50.5	13.37%	$43.8	$17.5	$2.6
			7% discount	**$321.4**		$25.1
			3% discount	**$376.6**		$28.8

1 Calculated by multiplying 92,689 (estimate of average gallons released per event, adjusted to account for improvements in the tank car fleet) times $218 (estimate of societal cost per gallon released) times 2.5 (estimate of events per year).

[93] See 2017 BTS Fleet Report, pg. 6

As can be seen, the estimated costs of the final rule are approximately 7.6 - 7.8 percent of expected damages resulting from the events that the final rule could affect, depending on whether benefits and costs are discounted at 7 or 3 percent. This means that if this final rule achieves a reduction of 8 percent in the total consequences of these events, benefits will be approximate to costs. This is the basis of our breakeven analysis.

The Agency uses the breakeven analysis approach because we have faced difficulties in estimating an accurate effectiveness rate for the comprehensive rail OSRP program codified in this final rule. This difficulty stems in part from the fact that observational data on a Federal comprehensive rail OSRP program does not exist; the applicability of 49 CFR part 130 prior to this rule meant that no railroads were required to have a comprehensive OSRP on a regulatory basis. As such, developing a rail OSRP effectiveness rate that is data-driven would most likely require retrospective regulatory review, wherein PHMSA-OHMS compares and analyzes the severity of incidents prior to and after the implementation of comprehensive plans in accordance with our revised regulations and tries to control for confounding variables. Both USCG and PHMSA-OPS used this strategy of retrospective review to generate their effectiveness rates; USCG conducted an "OPA 90 Programmatic Regulatory Assessment" in 2001 and OPS developed the "Final Regulatory Evaluation of the Response Plan Requirements for Transportation-Related Onshore Oil Pipelines" in 2004 *after* issuing the OPS interim final rule that established pipeline OSRPs. Given the research and efforts of PHMSA-OPS and USCG, we feel it is appropriate to use their effectiveness rates in order to proactively generate a benefits outlook for this rule. Furthermore, we believe that a rate substantially higher than 7-8 percent could reasonably be expected. Other Agencies (PHMSA–OPS, USCG, and EPA) have used much higher estimated effectiveness rates for promulgating comprehensive OSRP requirements for other industries. These estimates are further discussed in the following section of this final RIA (Section 3.2). PHMSA did not receive public comment on rail OSRP effectiveness rates despite attempts to solicit this input in Section 4.3 of the preliminary RIA.

3.2. Effectiveness of OSRPs

Several elements contribute to the overall cost of an oil spill. For example, incidents may involve costs associated with property damage, emergency response, evacuation of residents or workers in the surrounding areas, environmental damage, and transportation delays while the spill is being cleaned up. Factors such as the population density where the spill occurred, proximity to a sensitive resource, or circumstances of the accident will also affect the potential costs associated with a spill.

While there is no overt mechanism by which OSRPs would reduce the *frequency* of incidents occurring, based on an evaluation of the implementation of OSRPs for other industries (e.g., commercial vessels, pipelines), PHMSA has determined that having a comprehensive plan will likely reduce the *severity* of incidents that occur, thereby also reducing the associated damages. In addition, the comprehensive OSRP requirement might potentially reduce the frequency of spills indirectly by increasing situational awareness.

In 2001, after promulgating several regulations directed at oil spill prevention, mitigation, cleanup, and liability in response to broad mandates contained in OPA 90, the USCG and the Volpe National Transportation Systems Center prepared a Programmatic Regulatory Assessment to

evaluate the combined benefit, cost, and cost effectiveness of OPA 90 regulations.[94] As a part of that analysis, a panel of seven private-sector and USCG experts was asked to assess the effects of each rule on four major oil spill events. Based on the results of that assessment, effectiveness factors for reducing the severity of incidents were estimated for several key requirements (e.g., double hulls, spill source control and containment, vessel response plans). The estimate from the expert panel for effectiveness of vessel response plans was 14.8 percent.[95] In 2013, the USCG used this same effectiveness factor (rounded to 15 percent) in the evaluation of benefits for the Nontank Vessel Response Plans final rule.[96]

As another example, OPS finalized in 2005 regulations establishing oil spill response planning requirements for onshore oil pipelines.[97] In the regulatory evaluation for the rule, OPS used historical data on spills to estimate that the response plan requirements reduced the quantity of oil spilled by an average of approximately 806,000 gallons per year, or a 31.3-percent reduction in damages associated with pipeline spills. If the requirements of this rule for rail OSRPs have equivalent effectiveness, the rule would produce substantial net benefits, at either the USCG rate or OPS rate.

Table 31 presents estimated benefits at these two effectiveness rates. If the requirements of this rule for rail OSRPs have equivalent effectiveness, the rule would produce substantial net benefits, at either the USCG rate or OPS rate.

Table 31. Benefits, Costs, and Net Benefits Using USCG and PHMSA Pipeline Effectiveness Rates (millions)

Year	10 Year Benefits, 14.8 Percent Effectiveness	10 Year Benefits, 31.3 Percent Effectiveness	10 Year Costs	Net Benefits, 14.8 Percent Effectiveness	Net Benefits, 31.3 Percent Effectiveness
1	$6.1	$12.9	$6.8	-$0.7	$6.1
2	$6.2	$13.1	$2.6	$3.6	$10.5
3	$6.2	$13.2	$2.6	$3.7	$10.6
4	$6.3	$13.3	$2.6	$3.7	$10.7
5	$6.4	$13.5	$2.6	$3.8	$10.9
6	$6.4	$13.6	$4.8	$1.7	$8.8
7	$6.5	$13.7	$2.6	$3.8	$11.0

[94] Economic Analysis Division - John A. Volpe National Transportation Systems Center. (2001, May). *2001 OPA 90 Programmatic Regulatory Assessment (PRA) – Benefits, Costs, and Cost Effectiveness of Eleven Major Rulemakings of the Oil Pollution Act of 1990*. Retrieved from: http://www.regulations.gov/#!documentDetail;D=USCG-1998-3417-0006

[95] Ibid. pp 7–6.

[96] USCG-2008-1070. (2013, May). *Nontank Vessel Response Plans and Other Vessel Response Plan Requirements-Final Regulatory Analysis and Final Regulatory Flexibility Analysis for the Final Rule,* pp 30–31. Retrieved from http://www.regulations.gov/#!documentDetail;D=USCG-2008-1070-0046

[97] (2005, February 23). Pipeline Safety: Response Plans for Onshore Transportation-Related Oil Pipelines. *Federal Register*, *70*(35), 8734–8748. http://www.gpo.gov/fdsys/pkg/FR-2005-02-23/pdf/05-3257.pdf

8	$6.5	$13.7	$2.6	$3.9	$11.1
9	$6.5	$13.7	$2.6	$3.9	$11.1
10	$6.5	$13.7	$2.6	$3.8	$11.1
Discounted 7%	**$47.6**	**$100.6**	$25.1	**$22.5**	**$75.5**
Discounted 3%	**$55.7**	**$117.9**	$28.8	**$26.9**	**$89.1**

Comparing the benefits under these alternative effectiveness rates using the high-cost scenario from the cost sensitivity analysis section, the rule would still have positive net benefits.

The most likely drivers for the quantity spilled are the number of breached tank cars and the quantity of oil carried by those cars. The rule is anticipated to reduce the damages that result from the quantity spilled rather than reduce the quantity spilled in the event of a derailment. Two spills of similar magnitude in the same environment would entail different levels of damages depending on how well the response is coordinated, how long it takes for the elements of response to arrive, how capable the response is upon arrival, the training of the railroad and response personnel, the mitigation strategies applied and equipment used, etc. We also note that, if this rule increases situational awareness of risk on the part of the rail industry, it may indirectly reduce the number of derailments of trains hauling crude oil, and thereby reduce the total quantity of oil spilled. However, the Agency is not able to estimate such an effect at this time. Public comments to the NPRM on this issue were limited and did not serve in the effort to quantify and monetize the benefits of the rule.

Nevertheless, in addition to the break-even analysis and comparison with other modes' effectiveness rates, another way to look at the impact of this rule is to look at some measure of industry revenue and compare that to the total cost of the rule. We can estimate that the typical tank car hauls 667 barrels (approximately 28,000 gallons) of product. The EIA Short Term Energy Outlook estimates that crude oil will average about $59 per barrel in 2019. So, each tank car hauls product worth approximately 667 x $59 = $39,353. Dividing this figure into the undiscounted cost of the rule, we find that approximately 769 carloads would yield revenue sufficient to cover the cost of the rule. 769 carloads represents about 3/1000 of 2016 shipments (0.26 percent). Put another way, the revenue from approximately 8 unit trains of crude oil would be enough to cover the estimated costs of this rule.

3.2.1. Evidence of Potential Oil Spill Response Improvement

The Agency examined post-accident reports, news reports, and evidence provided by EPA, FRA, and PHMSA personnel to develop a picture of the responses to recent rail crude oil spills. We refer readers to the preliminary RIA for information on the May 6, 2015, Heimdal, ND derailment and derailments that occurred prior to the Heimdal derailment. We summarize more recent derailments in Appendix B of this document. The preliminary RIA also includes a more extensive qualitative discussion of the potential benefits of a comprehensive plan, specifically how a comprehensive plan may improve spill response.

3.3. Benefit Uncertainties and Unquantifiable Benefits

In this section, the Agency describes uncertainties associated with the estimates it developed to monetize damages associated with crude train derailments. These uncertainties stem from variability in the estimation of damages and incident severity, and difficulties in forecasting future events. For a more detailed discussion of these uncertainties, we refer the reader to the preliminary RIA in the rulemaking docket.

3.3.1. Damage estimates for crude oil and ethanol spills

Comprehensive societal costs are especially uncertain or difficult to obtain for rail incidents for the following reasons:

- Immediate response and cleanup are often the only cost elements reported when an incident occurs, rather than long-term effects for which the costs are difficult to measure or to prove resulted from the spill.
- Most research efforts have focused on crude oil maritime spills, which may have limited applicability to rail incidents.
- Relatively fewer studies examine spills in rail transport.

As a result of questionable cost reporting following incidents, and the wide range of estimates available from the literature, in addition to the variance due to specifics of terrain, natural features, and the type of crude oil spilled, there is a high degree of uncertainty regarding the costs imposed on society by these incidents. Thus, the value used in this analysis to monetize oil spill costs may overestimate or underestimate the true costs of rail oil spill incidents. Please see the preliminary HM-251B RIA and HM-251 HHFT final rule for PHMSA's literature review relevant to spill costs. We did not receive adverse public comment regarding our estimate to monetize spill costs.

3.3.2. Incident Severity

Crude oil incidents vary in size and the amount of damages they inflict on society. An event in a particularly environmentally sensitive area, or one that substantially degrades a high-value public asset such as a source of drinking water, will impose higher costs than a comparable event in a less sensitive area. In addition, the quantity released during an event varies due to several factors. One such factor in this case is the quantity of crude oil present in a train consist when it derails. Another factor is the type of tank car carrying a product (e.g., DOT-111, DOT-117).

The Agency attempted to accurately estimate the overall effectiveness of the tank car upgrades mandated by the HM-251 final rule. A validated computer simulation model was used to estimate the impacts of the various enhancements mandated in that final rule on the likelihood of puncture in different derailment scenarios. Any computer simulation has limitations, so although the Agency believes it used the best tool available to estimate the benefits of the tank car and other enhancements mandated by HM-251, the simulation model may not perfectly replicate real-world derailment scenarios. As a result, although we have applied the HM-251 effectiveness rate (see section 3.1.5. above) to reduce the societal damages associated with HHFT derailments in anticipation of that rule's impacts on future events, those effectiveness rates may not perfectly simulate the real-world impacts of the HM-251 rule. The true effectiveness of the rule may differ

from the Agency's estimates. Furthermore, it is unclear whether the simulations used by the Agency would tend to over or underestimate the effects of the rule, so the direction of the inaccuracy is also unknown.

3.3.3. Number of Crude Oil HHFT Incidents

The Agency faces several challenges in forecasting the future number of incidents involving HHFTs carrying crude oil. The primary challenge is that there are only 6 years of data during the era of high-volume crude oil shipments, and annual volumes have fluctuated widely during this time period. Ideally, the forecast number of events would be based on the volume of product shipped in HHFTs because it would be specific to the applicability of the rule. Failing that, forecasting forward based on volume of product shipped would be a next-best solution. The short timeframe of HHFT shipments of crude oil, however, presents challenges for forecasting into the future, because one straightforward method for making such a forecast, if a sufficient timeline existed, would use the past relationship between crude oil production and high-volume crude oil shipments and extrapolate that trend forward using EIA's Annual Energy Outlook production forecast. The Agency could then estimate an incident rate over time and identify whether the relationship between events and volume is stationary, increasing, or decreasing. Unfortunately, a sufficiently long timeline to make such an extrapolation is lacking.

The Agency described two alternatives above in section 3.1.2 to forecast the number of events going forward. One uses time as an independent variable and the number of events as the dependent variable. Thus, given x number of years of HHFT crude oil shipments and y events, we calculate y / x events per year and multiply that ratio by the analysis period. The second approach uses volume rather than time as the independent variable, and is the approach used to forecast future events in the recent RIA used to re-evaluate the efficacy of ECP brake systems. Neither approach adjusts for the possibility that the rate of derailment may be changing over time due to changes in industry practices, economic pressures, or other factors. The Agency has chosen to use what it views as the more conservative (lower carload volume) of these two approaches described in section 3.1.2. In any case, the Agency's method, or any alternative method, is unlikely to produce entirely accurate results, so the number of future events that may occur is another area of uncertainty.

3.3.4. Non-Quantified Benefits

As noted above and in the preliminary RIA, it is unlikely that estimates of the cost of spilled oil capture the entirety of the costs imposed on society and the environment from these incidents. Some portion of the benefits associated with mitigating these events goes unquantified due to this limitation. Secondly, the Agency has not applied any quantification of deaths and injuries associated with these events. Although a response plan is unlikely to reduce immediate deaths and injuries at the time of the incident (e.g., deaths or injuries associated with a building, vehicle, or train operator being impacted by a collision or derailment or its immediate aftermath), planning and training requirements may prevent injuries to railroad employees and response providers. The reduction in risk of deaths and injuries during incident response has not been quantified. In addition to uncertainty regarding the effect of the rule on preventing deaths and injuries, we can only identify 1 injury and 0 deaths in crude oil HHFT incidents in the U.S through PHMSA 5800.1 incident reporting. The 1 injury is from the Mt. Carbon, WV derailment.

Finally, contamination of soil or water, or pollution of air in the event of a fire, can impose long-term health consequences if people are exposed to the toxic chemicals introduced to the soil, water, or air. Due to data uncertainties and limitations, the lack of quantitative data submitted as public comment, and the analytical difficulty, PHMSA does not quantify long-term health consequences from crude oil HHFT derailments. In addition, there are considerations that place uncertainty upon the extent of long-term health consequences from crude oil HHFT derailments. For instance, the air pollution from such events may be avoided by evacuation, and may be of relatively short duration. While exposure to contaminated water or soil may pose some long-term risk, it may be avoided through adequate cleanup and water quality monitoring.

Table 32 below presents the areas of spill cost uncertainty and the direction, if known, in which they are likely to vary compared to the primary estimates used in this analysis.

Table 32. Benefit Uncertainties

Benefit Area	Direction of Uncertainty			Brief Explanation of Cause of Uncertainty
	Underestimation	Overestimation	Unknown	
Cost imposed on society from an oil spill incident	X			Many of the oil spill studies examined that estimate a comprehensive range of costs find higher costs per gallon associated with these incidents.
Incident severity			X	The severity of future incidents is unknown and difficult to predict with absolute certainty. In addition, at this point the accuracy of the effectiveness rates used to adjust our baseline for implementation of the HM-251 rule is unclear. That rule may be more or less effective than estimated.
Number of HHFT crude oil incidents			X	PHMSA's methodology for predicting the number of future events is conservative when compared to an alternate approach based on events per unit of volume of crude shipped by rail.
Deaths and injuries prevented			X	Crude oil spill events pose the potential for deaths and injuries to response personnel, railroad employees, and the public. PHMSA has not estimated or monetize the number or severity of deaths and injuries during spill response due to uncertainties. Uncertainty surrounds whether this rule's requirements would prevent fatalities or injuries and the extent to which it can mitigate their severity.

4. Appendix A: Research and Data Availability on OSRP Costs

As noted elsewhere in this analysis, PHMSA received public comment indicating that some of our preliminary cost estimations were low. While these comments did not include data or information with which to revise our preliminary estimates, PHMSA attempted to obtain better data and information. In developing our analyses, we aim to be data-driven and view input from stakeholders, including subject matter experts, to be preferable to simply making new assumptions. When public comments indicated our plan development and maintenance costs were low, we thought about revising them upwards, but did not know to what extent we should do so.

In order to obtain better information to estimate plan-related costs, we reached out a small number (~5) of third party (non-railroad) OSRP plan writers ("plan writers") by phone and e-mail. We asked for voluntary information about the level of effort required to develop a comprehensive plan for the rail context, and how this level of effort would be allocated between the core plan and different response zones. We also asked if the plan writers had experience responding to oil spills, since some organizations provide spill response services similar to OSROs as well as develop plans. In addition, we asked about experience giving or participating in PREP exercises, and for the plan writers' estimation of the effectiveness of comprehensive rail OSRPs.

While the plan writers were able to give background information, only 1 provided estimates for the level of effort. PHMSA used this input to revise our estimation of plan development costs. It is reflected in Section 2 of this final RIA, where it relays that a comprehensive plan is expected to require 180 hours of effort to develop the core plan, and another 180 hours for each response zone. Each block of 180 hours was further broken down into 40 hours of senior time, 40 hours of administrative time, and 100 hours of mid-level staff time. This revision upward on plan development costs was also reflected in plan maintenance/review costs, since plan review costs are derivative of the amount of time to initially develop a plan (10 percent of initial development costs).

Public comment also mentioned that training programs may cost more than estimated, but we were unable to obtain additional input on this issue. For example, we did not succeed at obtaining additional input on the cost of a GIUE exercise or more specific estimates on training event costs that align with PREP. We further contend that the full extent of railroads' training programs on hazmat preparedness and oil spills cannot be attributed to this final rule; it is certainly possible that railroads have made and will make voluntary decisions regarding training and exercise preparedness that exceed the minimum requirements of this rule.

PHMSA would have benefited from more comprehensive information on these areas, especially from the regulated community during the public comment process. What is reflected in this final RIA is the result of our judgment, assumptions, reasoned approach to public comment, and the available data and information given the agency's resources and capabilities.

For additional comment discussion and response, please see the final rule preamble. This discussion is included here for analytical purposes, namely to describe the agency's representation of the expected costs and benefits of this rule and how it evolved between the NPRM and final rule.

5. Appendix B: Incident Response Narratives

In developing this final rule, PHMSA collected and reviewed information from various sources pertaining to derailments involving releases of crude oil. All accidents involving a release of hazardous materials in transportation in the U.S., including derailments, are reported to PHMSA and are recorded in the hazardous materials incident report database.[98] This searchable incident report database is accessible at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch. The database includes the incident date, location (city and state), mode of transportation, carrier information, shipper information, number of fatalities or injuries, monetary damages, type of hazmat involved, quantity of hazmat released, and other information. Information from PHMSA 5800.1 incident reports helped in developing our analyses in support of this rulemaking. Nonetheless, the information contained in PHMSA incident reports is not exhaustive, so we also collected information from other resources, such as FRA Accident/Incident Reports, FRA investigation reports, and EPA On-Scene Coordinator (OSC) reports, which are publicly available at: http://epaosc.org.

In addition, PHMSA used some information gathered from common, publicly available news sources (e.g., Internet-based sources).

In this final RIA, we provide summaries of the derailments that occurred in 2016 and 2017, as well as summaries of the 2015 Watertown, WI and Culbertson, MT derailments, which were initially referenced, but not discussed extensively, in the preliminary RIA. PHMSA provides narratives and discussion of the circumstances and consequences of these derailments to the extent possible amid limited information. PHMSA has identified these derailments as likely to have involved trains transporting 20 or more tank cars of petroleum oil in a continuous block or 35 or more tank cars dispersed throughout the train in conformance with the applicability of this rule. Furthermore, these derailments resulted in releases of petroleum oil that harmed or posed a threat of harm to the environment.

5.1. Plainfield, IL

Overview

According to FRA data, on June 30, 2017, a Canadian National Railway (CN) train operated by a CN subsidiary consisting of 113 tank cars loaded with hazmat, including crude oil, derailed 19 cars near Plainfield, IL.[99] The PHMSA incident report suggests that 21 cars were derailed, not 19. According to both FRA and PHMSA data, 5 cars released crude oil.[100] PHMSA's 5800.1 report indicates that 28,245 gallons were spilled, whereas the FRA Accident Detail report indicates approximately 30,045 gallons. There were no evacuations, fires, or injuries reported.

[98] See 49 C.F.R 171.15, 171.16.
[99] FRA Accident Detail Report, querying for "Plainfield" in June 2017, available at: https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx
[100] PHMSA 5800.1 report, # I-2017070267, available at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx

Harm or Threat of Harm

This incident precipitated a response from the U.S. EPA, specifically Region V.[101] There is very limited information on the EPA's site for this oil spill. For other crude oil derailments, the EPA OSC site has provided reports detailing response activities and how the oil affected the environment, such as the water or land resources affected or threatened. For the Plainfield, IL derailment, the EPA OSC states that the derailment "cause[d] oil to be released into the environment" and corroborates that the spillage occurred.

Given the limited information available on the EPA OSC site for this derailment, we look at other sources. One source indicates that the DuPage River was nearby, within 1,200 feet away from the derailed train.[102] The same source relays that "EPA had not found any signs of oil in nearby waterways" and "air monitoring did not suggest any problems."[103] According to this source, the Plainfield police chief said, at a news conference, "We believe by all standards that there is no measurable risk to the community."[104]

Another news source indicated that the oil spill resulted in contaminated soil, and that the cleanup of the spill in the days after the derailment would include the removal of this contaminated soil.[105] This news report was released on July 4, 2017, indicating that cleanup was on-going for at least a few days after the spill. It also relayed that the cleanup was "proceeding well and [would] continue through the week." On July 7, 2017, the same local news source relayed that "[o]n site monitoring of air quality and ground contamination continues around the clock with no health issues identified at this time."[106] An article released in September 2017 claimed that the cleanup ultimately lasted "weeks."[107]

External news sources indicate that the Federal Railroad Administration (FRA) started an investigation into the Plainfield, IL derailment and that the investigation's report would be available on the FRA website when released. As of April 24, 2018, this report does not appear to be released on the FRA website.[108] Nevertheless, the fact that FRA started an investigation provides indication that the Plainfield, IL derailment met FRA's general criteria for accident

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[101] U.S. EPA On-Scene Coordinator site for 6/30/17 Plainfield, IL derailment, available at: https://response.epa.gov/site/site_profile.aspx?site_id=12263

[102] "Train derailment dumps thousands of gallons of crude oil in Plainfield," Alicia Fabbre, Chicago Tribune, July 1, 2017, available at: http://www.chicagotribune.com/news/local/breaking/ct-train-derailment-dumps-thousands-of-gallons-of-crude-oil-in-plainfield-20170701-story.html

[103] Ibid.

[104] Ibid.

[105] "Cleanup Continues After Plainfield Train Derailment, Oil Spill," Associated Press News Partner & Plainfield Patch, July 4, 2017, available at: https://patch.com/illinois/plainfield/cleanup-continues-after-plainfield-train-derailment-oil-spill

[106] "Train Speeds Increase, Cleanup Progressing After Plainfield Train Derailment," Shannon Antinori, Plainfield Patch, July 7, 2017, available at: https://patch.com/illinois/plainfield/train-speeds-increase-cleanup-progressing-after-plainfield-train-derailment

[107] "Plainfield Derailment Could Leave Thousands Without Heat This Winter: Nicor," Shannon Anitnori, Plainfield Path, September 29, 2017, available at: https://patch.com/illinois/plainfield/250k-could-be-without-heat-winter-thanks-plainfield-derailment

[108] "eLibrary Search." FRA Investigations of Railroad Accidents. U.S. Federal Railroad Administration, available at: https://www.fra.dot.gov/eLib/Find#p1_z10_gD_lAC

investigation, although this has not been confirmed. Among these criteria is the criterion that FRA generally investigates accidents and incidents that involve "fire, explosion, evacuation, or release of regulated hazardous materials, especially if it exposed a community to these hazards or the threat of such exposure."[109]

In sum, the information on the effect or possible effect of the Plainfield, IL derailment on the environment is limited. From what is available, it is certain that multiple tank cars released crude oil, resulting in a spill near the DuPage River, but it does not appear that the spill entered the river. Further, the spillage contaminated soil and required a cleanup effort. The extent length of the cleanup is not clear, nor is it clear the quantity that was recovered versus the quantity that remained in the environment. It does not appear to have affected air quality. Some sources indicate that local residents could smell oil in the air.[110] While not related to environmental quality, there is also indication from local news sources that local businesses were affected and closed in reaction to the derailment and spill response.[111]

Response and Discussion

Information regarding the response to the Plainfield, IL derailment is limited. In particular, the EPA OSC site does not contain any reports detailing the spill response. In addition, it appears the FRA investigation report is not yet available publicly, and the PHMSA incident report does not detail the spill response.

Using external news sources, we find some commentary on the response effort. One source relayed that, "First responders in Plainfield said prior training with the railroad helped them to better prepare for a crude oil train derailment. [The first responders] said they had the situation under control within two hours."[112]

This limited information does not necessarily point to possible improvements for the response to the Plainfield, IL derailment." For example, sources do not cite a lack of resources or an inability to access the derailment site. The information summarized here points to limited spill impacts and an effective response. However, the media reports refer to the incident as a "close call," and the Plainfield Fire Chief related the need to learn from the incident.[113]

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[109] "Accident Data, Reporting, and Investigations," FRA, available at: https://www.fra.dot.gov/Page/P0037 [see "FRA Accident Investigations (general criteria)"]

[110] " 'We were very lucky': Plainfield's escape from train disaster gives town pause," Marni Pyke, Daily Herald, July 10, 2017, available at: http://www.dailyherald.com/news/20170710/we-were-very-lucky-plainfields-escape-from-train-disaster-gives-town-pause

[111] "Plainfield Police Provide Update After Train Derailment," Emily Florez and James Neveau, NBC 5 Chicago, July 1, 2017, available at: https://www.nbcchicago.com/news/local/plainfield-police-update-cleanup-after-train-derailment-432049103.html

[112] "Emergency Response Tested by Crude Oil Derailment," Chris Coffey, NBC 5 Chicago, July 3, 2017, available at: https://www.nbcchicago.com/investigations/emergency-responders-tested-crude-oil-train-derailment-432349873.html

[113]" 'We were very lucky': Plainfield's escape from train disaster gives town pause," Marni Pyke, Daily Herald, July 10, 2017, available at: http://www.dailyherald.com/news/20170710/we-were-very-lucky-plainfields-escape-from-train-disaster-gives-town-pause

In this light, if the incident had been more severe, a comprehensive plan would ensure that resources sufficient to respond to a worst-case discharge would be available. For example, the worst-case discharge planning volume for a response zone containing Plainfield, IL would be approximately 500,000 gallons of oil ((113 tank cars * 30,000 gallons each) * 0.15), provided that the train involved in the Plainfield, IL derailment were the largest train configuration expected to operate in the area. Therefore, the actual spillage in the event (28,245 gallons), according to the PHMSA incident form filed, was approximately 6 percent of this hypothetical WCD planning volume. As such, it might be offered that the final rule would have afforded a high level of response capability above and beyond the quantity spilled at the derailment.

In addition, one news source indicated that 30 different state, federal, local, and private agencies were on-site, working to clean up the spill.[114] A comprehensive plan could improve the ability of plan holders to cooperate across such a diverse array of public and private organizations and improve coordination.

5.2. Money, MS

Overview

According to FRA data, on April 30, 2017, a Canadian National Railway (CN) train operated by a CN subsidiary consisting of 114 tank cars loaded with hazmat, including crude oil, derailed 2 tank cars near Money, MS.[115] One tank car released crude oil, spilling approximately 24,653 gallons according to the PHMSA 5800.1 incident filing.[116] In the FRA Accident Detail report, 1 injury is identified; however, in the PHMSA incident filing, no injuries are identified. In the FRA and PHMSA reports, no evacuation is indicated; however, external new reports mention that "some residents were evacuated."[117] Both the PHMSA and FRA data indicate a fire occurred.*Harm or Threat of Harm*

The information available on this incident is limited. EPA does not appear to have an OSC website for this derailment and spill. However, from the PHMSA incident report, we have evidence that the spill occurred and affected the environment. On the PHMSA 5800.1 form, we have indication that "environmental damage" occurred.[118] Specifically, there is a binary indicator on the form for whether environmental damage occurred and the 5800.1 filing for this incident has positive indication (question #30). We have further indication that the spill cleanup involved "in-house" as well as "other" resources. The response cost totaled $65,000 according to the same filing.

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[114] "Train derailment dumps thousands of gallons of crude oil in Plainfield," Alicia Fabbre, Chicago Tribune, July 1, 2017, available at: http://www.chicagotribune.com/news/local/breaking/ct-train-derailment-dumps-thousands-of-gallons-of-crude-oil-in-plainfield-20170701-story.html

[115] FRA Accident Detail Report, querying for "Money" in April 2017, available at: https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx

[116] PHMSA 5800.1 report, # X-2017060427, available at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx [hereinafter # X-2017060427]

[117] "Railroad Reopens After Fiery Crash In Mississippi Delta," Associated Press, May 1, 2017, available at: https://www.usnews.com/news/best-states/tennessee/articles/2017-05-01/railroad-reopens-after-fiery-crash-in-mississippi-delta

[118] See X-2017060427

There is no apparent determination that the spill entered a waterway.

In addition to the PHMSA and FRA data, video footage from ABC News shows a smoke plume emanating from the derailment, and other news sources refer to the derailment as a "fiery crash."[119] Within the available sources, there does not appear to be any comment on air quality effects from the fire and smoke. An additional news source relayed a comment from the Mississippi Department of Environmental Quality that workers were removing the remaining oil on the day following the derailment.[120]

In sum, the available information is limited but we have indication from PHMSA and FRA data, as well as external news sources, that the Money, MS derailment resulted in spillage and likely harmed or posed a threat of harm to the environment.

Response and Discussion

Again, the information on this incident, including the spill response, is limited. We did not identify commentary on how the response unfolded or the challenges faced. This makes it difficult to assess the ways in which the final rule could have positively impacted the response to Money, MS.

However, on the PHMSA 5800.1 form, we have indication that weather conditions included "heavy rain."[121] A comprehensive plan requires preparation for a worst-case discharge, which includes the potential for adverse weather. We do not know from the available public resources how heavy rains may have affected the response, but a comprehensive plan could assist in planning for these weather conditions during a response.

5.3. Mosier, OR

Overview

On June 3, 2016, a Union Pacific (UP) freight train derailed in Mosier, OR.[122] It had 96 cars, 94 of which carried hazmat, including crude oil. Sixteen tank cars were damaged or derailed, and 5 tank cars released crude oil. According to PHMSA incident data, approximately 42,448 gallons of crude were released from these tank cars.[123] The derailment was adjacent to Highway 30,

[119] "Freight train carrying crude oil derails in Money, Mississippi," ABC News, April 29, 2017, available at: https://www.google.com/search?q=money+mississippi+derailment&rlz=1C1GCEA_enUS754US754&oq=money&aqs=chrome.0.69i59l2j69i57j69i60l3.1231j0j7&sourceid=chrome&ie=UTF-8
[120] "Railroad Reopens After Fiery Crash in Mississippi Delta," Associated Press, May 1, 2017, available at: https://www.usnews.com/news/best-states/tennessee/articles/2017-05-01/railroad-reopens-after-fiery-crash-in-mississippi-delta
[121] See X-2017060427
[122] https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx
[123] PHMSA 5800.1 report, # X-2016060795, available at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx [hereinafter # X-2016060795]

Interstate 84, and the Columbia River.[124] There were no deaths or injuries, but an evacuation of 147 residents occurred and several cars caught fire.[125]

Harm or Threat of Harm

The EPA On-Scene Coordinator Pollution/Situation Report (POLREP) #1 indicates the Mosier, OR derailment as involving "[e]mergency response to a threat of discharge of oil into navigable waters of the U.S."[126] The derailment took place along a rail line at or very near the crossing of Rock Creek, a tributary to the Columbia River.[127] EPA identified UP as the responsible party and issued a Notice of Federal Interest (NOFI) on June 7, 2016.[128]

It also resulted in damage to the local Waste Water Treatment Plan, which had to temporarily cease operations.[129] Approximately 13,000 gallons of oil were sucked into the treatment plant.[130] According to EPA, a minor amount of oil discharged from the treatment plant outfall pipe into the river, but this pipe was plugged and the oil removed.[131] This area was boomed and there were no observable impacts to fish or wildlife.[132] POLREP #3 notes that the main treatment plant was cleaned and repaired by UP and contractors to UP, and returned to service on June 20th, or more than 2 weeks after the derailment and cessation of normal operations.[133]

In POLREP #1, EPA noted that the tank car catching on fire resulted in an additional wildland fire impacting 5-10 acres.[134] In POLREP #2, EPA revised the number of wildland acres affected downward to "less than 1 acre," and in POLREP #3 to 1.3 acres.[135,136] EPA also noted that if the fire could not be controlled, the derailed oil train posed a "significant threat" to the river.[137] Further, firefighting cooling tactics presented the risk that oil and oily water would be flushed into Rock Creek, which was less than 200 yards away from the fire.[138] EPA noted the area is home to federally listed endangered fish.[139] The day following the derailment, EPA noted a "rainbow

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[124] "Moiser Oil Train Derailment," U.S. EPA, available at: https://response.epa.gov/site/site_profile.aspx?site_id=11637 [hereinafter: "EPA OSC Mosier Main"]
[125] Ibid.
[126] "Mosier Oil Train Derailment POLREP #1," U.S Environmental Protection Agency (EPA), June 3, 2016, available at: https://response.epa.gov/site/sitrep_profile.aspx?site_id=11637&counter=27106 [hereinafter "Mosier POLREP #1"]
[127] Ibid.
[128] "Mosier Oil Train Derailment POLREP #3," U.S Environmental Protection Agency (EPA), June 3, 2016, available at: https://response.epa.gov/site/sitrep_profile.aspx?site_id=11637&counter=27111 [hereinafter "Mosier POLREP #3"]
[129] Ibid.
[130] EPA OSC Mosier Main
[131] Ibid.
[132] Ibid.
[133] See Mosier POLREP #3
[134] See Mosier POLREP #1
[135] "Mosier Oil Train Derailment POLREP #2," U.S Environmental Protection Agency (EPA), June 3, 2016, available at: https://response.epa.gov/site/sitrep_profile.aspx?site_id=11637&counter=27109 [hereinafter "Mosier POLREP #2"]
[136] See Mosier POLREP #3
[137] See Mosier POLREP #1
[138] Ibid.
[139] Ibid.

sheen" on the Columbia River, but could not determine the pathway at that time.[140] The last POLREP (#3) notes that no sheen was seen after that day, June 4, 2016.[141]

In POLREP #3, EPA summarizes its estimation of the gallons lost to the spill and how it distributed into the environment, specifically "13,000 gallons in the adjacent WWTP [wastewater treatment plant] and piping, 16,000 gallons burned up and/or vaporized in air; and 18,000 gallons discharged onto the group and in soil."[142] Approximately 2 million gallons were used to put out the fire, which drew the city's backup drinking water well to very low levels.[143]

In addition to impacts to water, EPA conducted air monitoring due to the smoke and fire in the derailment area.

In addition to EPA reporting, ODEQ describes impacts to the environment, including disposal of 2,960 tons of petroleum-contaminated soil.[144] As relayed by ODEQ, the contaminated soil contained approximately 18,000 gallons of oil.[145] With respect to water impacts, ODEQ states, "[a] small amount of oil entered the Columbia River but the amount if unknown."[146] The ODEQ also mentions the possibility that "autumn rains" could lead to precipitation flushing additional oil into the river, and that "[i]nitial testing of the wells indicate[s] that there is only nominal contamination in the groundwater" at the tested wells south of the tracks, but "significant groundwater contamination" was found at one of the wells installed on the north side of the tracks.[147]

On the "Mosier derailment Fact Sheet," ODEQ relays that the community's water supply had been impacted by the fire response, and reinforces the EPA reporting claim that the community's wastewater treatment plant was damaged by the derailment and fire.[148] The fact sheet also mentions a "light sheen of oil" in the Columbia River at the mouth of Rock Creek.[149] This aligns with EPA reporting.

On the PHMSA 5800.1 form, there is indication that "environmental damage" resulted from the derailment, as well as spillage and entry of hazmat into a waterway/storm sewer.[150] Response costs were reported as $16,800 and remediation and cleanup costs as $7 million.[151] "In-house"

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[140] See Mosier POLREP #2
[141] See Mosier POLREP #3
[142] Ibid.
[143] Ibid.
[144] "Mosier UPRR Derailment," Oregon Department of Environmental Quality, available at: http://www.deq.state.or.us/Webdocs/Forms/Output/FPController.ashx?SourceId=6115&SourceIdType=11 [hereinafter "ODEQ Main"]
[145] Ibid.
[146] Ibid.
[147] Ibid.
[148] "Mosier derailment Fact Sheet 6-7-2016 – final with Spanish," ODEQ, June 7, 2016, available at: http://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=4719c5c5-8592-4ee2-9a4b-3476f448d2bbpdf&s=Mosier%20derailment%20Fact%20Sheet%206-7-2016%20-%20final%20with%20Spanish.pdf
[149] Ibid.
[150] See X-2016060795
[151] Ibid.

cleanup is also indicated.[152] These data lend support other findings of harm or potential harm to the environment.

In public comment to the NPRM, we have comments from the State of Washington Department of Ecology, which offered this about the Mosier, OR derailment: "While this derailment was not the worst-case scenario for which we have been preparing for, the impact on the local community was significant."[153] Washington State shares a waterfront with Oregon along the Columbia River Gorge.[154]

Several other commenters noted the importance of the Columbia River and its surrounding environment, including Riverkeeper and its partner commenters and Lake Pend Oreille Waterkeeper.[155] Riverkeeper references designated critical habitats for listed species, such as salmon and steelhead habitat along the Columbia River.[156] As such, these commenters provide further support that the Mosier, OR derailment posed harm or the threat of harm to the environment.

Response and Discussion

There is a variety of information available regarding the response to and circumstances surrounding the Mosier, OR derailment. This information includes multiple Pollution/Situation Reports (POLREPs) on the U.S. EPA On-Scene Coordinator website for the Mosier derailment, as well as the investigation report from FRA (HQ-2016-1136) and FRA Accident Detail report.[157,158,159] In addition, a few public comments to the NPRM mentioned the Mosier, OR derailment specifically, such as the comment from NTSB, the Washington Department of Ecology, and Riverkeeper and partner comments.[160] We also have available the PHMSA 5800.1 report and external news sources.[161] The Oregon Department of Environmental Quality has a repository of information on the Mosier, OR derailment.[162]

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[152] Ibid.
[153] Comment from the Washington State Dept. of Ecology, posted Sept. 26, 2016, available at: https://www.regulations.gov/document?D=PHMSA-2014-0105-0268 [hereinafter "Washington Dept. of Ecology comment"]
[154] Ibid.
[155] Comments to the NPRM are available in the docket (PHMSA-2014-0105) at: https://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=commentDueDate&po=0&s=columbia&dct=PS&D=PHMSA-2014-0105
[156] "OSRP_PHMSAComments_CoalitionFinal," Riverkeeper, posted Sept. 28, 2016, pg. 19, available at: https://www.regulations.gov/document?D=PHMSA-2014-0105-0337 [hereinafter "Riverkeeper comment"]
[157] See EPA OSC Mosier Main
[158] "Accident Investigation Report: HQ-2016-1136," Office of Railroad Safety, FRA, available at: https://www.fra.dot.gov/eLib/details/L19462#p1_z5_gD_kmosier
[159] Query for "Mosier" "OR" at https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx
[160] "Hazardous Materials: Oil Spill Response Plans and Information Sharing for High-Hazard Flammable Trains," PHMSA, July 29, 2016, available at: https://www.regulations.gov/document?D=PHMSA-2014-0105-0240
[161] See X-2016060795
[162] See ODEQ Main

According to EPA, 28 local and regional fire departments and hazmat teams responded to the derailment from both OR and WA.[163] In addition, representatives from the Oregon Department of Environmental Quality (ODEQ), the Washington Department of Ecology, and the Yakama Nation were part of the Unified Command.[164] Further, there were several cooperating agencies beyond those formed into the Unified Command, including the National Marine Fisheries Service, National Oceanographic and Atmospheric Administration (NOAA), U.S. Coast Guard, U.S. Army Corps of Engineers, the Federal Emergency Management Agency (FEMA), FRA, PHMSA and others.[165] This is an example of the diverse array of organizations that can be involved in a derailment, and a comprehensive plan is expected to enhance coordination among the various parties involved.

POLREP #3 states that by mid-morning of June 4th, a contract Incident Management Team (IMT) arrived at the Mosier, OR derailment site, having been mobilized by UP.[166] EPA claimed that this IMT "brought needed structure" to the incident.[167] This statement, while broad, suggests that the initial spill response could have been improved in some ways, by having additional "structure." PHMSA expects that a comprehensive plan would improve coordination during the initial spill response and enhance the organization and structure of the spill response, specifically through training requirements and ensuring that railroad employees know their responsibilities under the plan and can make the proper notifications to other organizations as needed.

In addition, while we may not know exactly when the UP-mobilized IMT arrived, they arrived mid-morning the day after the derailment, which had occurred around 12:15pm.[168] This suggests the UP-mobilized IMT arrived on site more than 12 hours after the derailment. In the final rule, plan holders are expected to identify and describe in the plan the resources which are available to arrive onsite within 12 hours after the discovery of a worst-case discharge, or substantial threat of a discharge. If the railroad's plan had identified the IMT and its response resources as part of the response zone containing Mosier, OR, there would be an expectation that these resources could reasonably arrive on site in less time than was apparently needed to arrive at the Mosier, OR derailment. If an incident like Mosier, OR occurred again, a comprehensive plan might encourage a speedier arrival by response providers, such as a contract IMT. Please note, this is discussion offered for the purposes of analyzing the benefits of this rule; please refer to the preamble and regulatory text of the final rule, not the final RIA, for the language codified into the CFR and explanation of agency intent.

POLREP #3 also describes challenges with respect to handling temporary storage and disposal of crude oil contained within the derailed tank cars. According to this POLREP, a plan was needed to build a temporary storage and transloading facility at a railyard outside of Mosier, and this plan needed approval by the Unified Command and the city of The Dalles.[169] A comprehensive plan could assist in planning for these types of spill response activities and encourage the dissemination

[163] See EPA OSC Mosier Main
[164] See Mosier POLREP #3
[165] Ibid.
[166] Ibid.
[167] Ibid.
[168] See EPA OSC Mosier Main and Mosier POLREP #3
[169] See Mosier POLREP #3

of lessons learned and best practices both within the plan holder's organization as well as across stakeholder groups.

POLREP #3 mentions discussion among the UC about resuming movement on the rail line. It appears UP requested permission to resume operations on June 5th, roughly 2 days after the derailment, even though several of the non-breached railcars still contained crude oil.[170] The UC assessed and inspected the cars, and based on air monitoring around them, agreed that train traffic could resume at a low speed given there was "no danger for fire or discharge of oil."[171] PHMSA believes a comprehensive plan would be applicable to ensuring workplace safety and making decision such as the one exemplified here.

Additionally, POLREP #3 describes the type of equipment needed for workers if "elevated" levels of air pollutants are discovered during air monitoring.[172] The "[w]orkers at the WWTP [Waste Water Treatment Plant] were required to wear respirators until levels abated."[173] PHMSA believes a comprehensive plan would have a positive influence on ensuring workplace safety efforts, such as this one.

According to the same source, the "first train" after operations resumed rolled through town during a public meeting, upsetting some residents and "creating a security issue."[174] The EPA OSC website has a file repository, which includes a flyer for a public meeting.[175] It includes event and contact information as well as information critical to safety. POLREP #3 cites, "[h]uge effects of derailment and fire on community. Emotions raw, and concern high as oil trains continue to move through their community and both sides of the Columbia River," as well as "[i]ntense media and political interests."[176] A comprehensive plan may be applicable to improving the public's perception of risk if and when rail operations resume.

Moreover, POLREP #3 mentions that an "additional collection" of oil in the water treatment pipe was discovered on June 6th.[177] It remains somewhat unclear, but it would appear oil did not re-enter the river.[178] The main EPA OSC web page for the derailment suggests that it did not, as it states, "no oil [was] observed in the River since June 4."[179] A comprehensive plan may improve the ability of the plan holder to identify sources of potential oil contamination and ensure that monitoring for oil release is continual and sufficiently frequent.

POLREP #3 also mentions the transfer of lead oversight of soil and groundwater remediation to the Oregon Department of Environmental Quality (ODEQ).[180] PHMSA believes a comprehensive

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[170] Ibid.
[171] Ibid.
[172] Ibid.
[173] Ibid.
[174] Ibid.
[175] "Mosier Oil Train Derailment: Documents," EPA, available at: https://response.epa.gov/site/doc_list.aspx?site_id=11637
[176] See Mosier POLREP #3
[177] Ibid.
[178] Ibid.
[179] See EPA OSC Mosier Main
[180] See Mosier POLREP #3

plan would help in this type of coordination, specifically helping to understand roles and responsibilities among the plan holder and Federal and other stakeholders. This seems especially important as responsibilities are transferred and/or delegated. This POLREP notes that the monitoring of groundwater would last "for at least one year."[181] Again, the importance of this monitoring and the length of time underscores this need to define roles and responsibilities and set expectations for the spill's response and long-term remediation.

In the PHMSA 5800.1 form, the description of events notes that, "[d]uring the re-positioning of the car for transfer the bottom outlet valve handle was actuated on debris causing a release of 50 gallons of lading."[182] PHMSA believes comprehensive plan may encourage the sharing of best practices and lessons learned in re-positioning of derailed or potentially damaged tank cars. Possibly there were techniques to prevent this unintended release during re-positioning and if so, including these in training or exercise programs could improve spill response outcomes.

In the public comment from the State of Washington Dept. of Ecology, it is noted that the Mosier, OR derailment demonstrated the need for a coordinated effort on the part of the rail carrier (plan holder), the Federal government, and states whose waters are affected.[183] As provided in this public comment, PHMSA believes that comprehensive plans will further this coordination by aligning spill response efforts with the Clean Water Act's national framework.[184]

In the public comment from Riverkeeper, the commenter relays that the derailment in Mosier, OR provides "some insight into the need for more rapid response."[185] The comment notes that the Governor invoked an emergency since the resources needed exceeded local resources.[186] The comment suggests that a more rapid response would have contained the oil spill from reaching waters and critical habitat.[187] PHMSA believes that comprehensive plans may contribute to faster responses by improving response coordination and these plans include certification that the plan holder can respond to and remove a worst-case discharge. For additional comment response, please see the final rule preamble; this discussion is provided in the final RIA for analytical purposes, in order to present potential and/or expected benefits of the final rule.

One external news source cites the potential for "high winds," which could be considered an adverse weather condition.[188] Another claims that the winds were "oddly quiet" for the region during the time of the derailment and the "fire didn't spread like it could have."[189] PHMSA believes comprehensive plans will encourage planning for weather conditions that are common to the environments of a given response zone.

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[181] Ibid.
[182] See X-2016060795
[183] See Washington Dept. of Ecology comment
[184] Ibid.
[185] See Riverkeeper comment, pg. 20
[186] Ibid.
[187] Ibid.
[188] "Mosier Oil Train Derailment," Friends of the Columbia Gorge, available at: https://gorgefriends.org/protect-the-gorge/mosier-oil-train-derailment.html
[189] "How Bad Could the Mosier Oil Spill Have Been?" Emily Schwing, OPB, Aug. 10, 2016, available at: https://www.opb.org/news/series/oil-trains/mosier-oil-spill-how-bad/

Lastly, the comment from the NTSB include the following commentary on the response to the Mosier, OR derailment: "We have found that despite voluntary outreach and community awareness programs […], many communities and emergency responders are unprepared to cope with derailments that involve fires fueled by crude oil. The Mosier, Oregon HHFT derailment on June 3, 2016, is yet another example where the local emergency response community was ill-prepared to effectively respond to the derailment."[190] PHMSA believes that comprehensive plans will provide public safety and environmental protection that improves upon voluntary programs and enhances the availability of resources to respond to worst-case discharges, or the threat of one.

5.4. Watertown, WI

Overview

On November 8, 2015, a Canadian Pacific (CP) freight train consisting of 110 tank cars loaded with hazmat, including crude oil, derailed 15 tank cars near Watertown, WI.[191] Three of the derailed tank cars were breached, spilling approximately 500 gallons of crude oil, according to the report filed to FRA. According to other news reports, this amount was closer to 1,000 gallons.[192] In addition, the PHMSA 5800.1 report cites 1,000 gallons released.[193] The derailment forced the evacuation of approximately 35 homes (41 people) as a precaution.[194] No fires or injuries were reported.

Harm or Threat of Harm

In particular, the EPA OSC distinguishes a threat to waterways in the POLREP report by stating, "Continued oversight until threat of release to waters of the US is abated."[195] However, the Watertown, WI derailment does not appear to have affected water resources, but a dry drainage ditch that is a tributary to the Rock River was located approximately 50 feet from the release site.[196] EPA's Pollution/Situation ("POLREP") report indicates that the Watertown Fire Department was able to contain the release on site.[197] The report indicates that the "standing liquid" was vacuumed and CP would send plans to the local health department and State regarding remediation plans. According to the same report, soil remediation was needed due to the spill.

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[190] Public comment from NTSB, posted Sept. 27, 2016, available at: https://www.regulations.gov/document?D=PHMSA-2014-0105-0326
[191] http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx
[192] http://fox6now.com/2015/11/08/breaking-crews-on-scene-of-train-derailment-in-watertown/
[193] PHMSA 5800.1 report, # I-2016010013, available at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx [hereinafter # I-2016010013]
[194] http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx
[195] "cp watertown derailment POLREP #1," U.S Environmental Protection Agency (EPA), November 8-9, 2015, available at: https://response.epa.gov/site/sitrep_profile.aspx?site_id=11275&counter=25246
[196] Ibid.
[197] Ibid.

An external news source relays the same information, including the lack of entry into waterways and soil remediation activities, and adds that air monitoring readings did not exceed safe levels.[198] This news source indicates that the evacuation of 35 homes was conducted as a precaution.

The FRA issued an investigation report on this derailment, also stating that the crude oil did not reach waterways and that the evacuation was precautionary.[199]

The PHMSA 5800.1 report does not indicate environmental damages in the form's question #30. However, it confirms the spillage occurred, the quantity released, and that an in-house clean up took place. It also provides an estimate of $500,000 for the response costs; however, for PHMSA incident reporting, "Response Costs," are identified separately from "Remediation/Cleanup Cost."[200] Thus, it is not clear if the response costs include spill response, or if the costs summing up to $500,000 relate solely to other expenditures, such as costs incurred for local police and fire department services. The PHMSA incident form for this derailment provides that the cost of "Remediation/Cleanup" was $0.[201]

Response and Discussion

Information on the spill response to the Watertown, WI derailment is limited. For example, the FRA report focuses on the cause of the derailment, not the developments of spill response. In addition, the available information from U.S. EPA is limited to POLREP #1, which suggests the spill response was able to contain the spill on site, and does note any particular response challenges. Similarly, the PHMSA 5800.1 incident form does not indicate challenges in the response. The information provided by external news sources is also limited. One source includes comments from the Watertown Fire Chief and video content from a news conference following the derailment.[202] The fire chief relayed that there could have been a fire.[203] He also relayed training activities that were undertaken by the fire department (e.g., tabletop functional exercises), and their department's hazmat planning was cited as ongoing for over a year.[204] He also mentioned the State's Mutual Aid Box Alarm System (MABUS).

While the available information does not point to specific response challenges, a comprehensive plan would ensure that the plan holder has sufficient resources to respond to a worst-case discharge (WCD). A worst-case discharge includes discharges resulting from fire and explosion, so had there been a fire and additional spillage, a comprehensive plan would ensure this response circumstance was accounted for. The Watertown, WI derailment resulting in approximately 1,000 gallons spilled, which is a mere fraction of the quantity that would constitute a worst-case

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[198] "Search for answers: Cleanup enters day 2 after train carrying crude oil derails," Deandra Corinthios, Krystle Kacner, and Katie Delong, Fox 6 News, Nov. 9, 2015, available at: http://fox6now.com/2015/11/09/cleanup-continues-in-watertown-after-train-carrying-crude-oil-derails/ [hereinafter "Fox 6 News, Search for answers"]
[199] "Accident Investigation Report HQ-2015-1095," Office of Railroad Safety, U.S. Federal Railroad Administration (FRA), available at: https://www.fra.dot.gov/eLib/details/L18543#p1_z10_gD_lAC_kwatertown
[200] "Guide for Preparing Hazardous Materials Incidents Reports," Pipeline and Hazardous Materials Safety Administration (PHMSA), Jan. 2004, available at: https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/reporting_instructions_rev.pdf
[201] See I-2016010013
[202] See Fox 6 News, Search for answers
[203] Ibid.
[204] Ibid.

discharge; as such, a comprehensive plan would assist in maintaining a large margin of preparedness for smaller release incidents such as the Watertown derailment.

A comprehensive plan may also assist in planning for and disseminating tactics to deal with different tank car conditions resulting from derailment or puncture. The video footage from the local news conference captures some of the considerations facing railroads, response providers, and officials in offloading product from a damaged or derailed car and moving these cars away from the site as appropriate. A comprehensive plan can be used to consolidate a plan holder's best practices, as well as the industry's.

5.5. Culbertson, MT

Overview

On July 16, 2015, a BNSF freight train consisting of 106 tank cars loaded with crude oil derailed 22 tank cars near Culbertson, MT.[205] Three of the derailed tank cars were breached, spilling approximately 35,000 gallons of crude oil, according to one news source.[206] According to reporting to FRA, 5 cars released and the quantity released was 27,201 gallons.[207] The derailment forced the evacuation of approximately 50 people.[208] No fires or injuries were reported.

Harm or Threat of Harm

EPA does not appear to have an OSC website for the Culbertson, MT derailment. EPA OSC websites often provide information on the extent of oil spills and whether they pose harm or the threat of harm to water resources.

The FRA investigation report states, "No water ways were affected by the spilled crude oil."[209] It provides that a BNSF hazmat team contained the spilled product using earthen dams.[210] In an FRA statement, the evacuation of nearby residents was described as a precaution.[211]

The PHMSA 5800.1 incident form indicates spillage, but no fire, explosion, or environmental damage.[212] In the form's "Description of Events," BNSF notes that "[t]he spill was contained by natural barriers on-site and free liquids were vacuumed and recovered for later disposal."[213] This narrative also relays, "Cleanup for the crude oil in soil remains underway including excavation

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205 http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx

206 Ibid.

207 http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incrpt.aspx

208 Ibid.

209 "Accident Investigation Report HQ-2015-1075," Office of Railroad Safety, U.S. Federal Railroad Administration, available at: https://www.fra.dot.gov/eLib/Find#p1_z10_gD_lAC_kculbertson [hereinafter "FRA Culbertson report"]

210 Ibid.

211 "FRA Statement on Culbertson Montana Derailment," Press Release Number: 99-9999, FRA Public Affairs, July 17, 2015, available at: https://www.fra.dot.gov/eLib/details/L16736

212 PHMSA 5800.1 report, # X-2015080186, available at: https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx [hereinafter X-2015080186]

213 Ibid.

product recovery and remediation." Further, the incident form specifies the response costs as $145,000 and remediation/cleanup costs as $481,965.[214]

An external news source provides that soil was contaminated and underwent cleanup/remediation.[215] Another source relays that crude oil did not reach any waterways.[216]

In sum, the available information describes that the soil may have been affected, but that waterways were not directly affected. It is unclear whether there was a threat of harm to waterways.

Response and Discussion

In general, the information available regarding the spill response is limited. FRA and PHMSA data do not outline spill response challenges, nor does there appear to be an EPA OSC report to refer to.

The FRA investigation report provides some information, however, on the emergency and spill response, noting the presence of Roosevelt County Sheriff's Department, Montana Highway Patrol and the Culbertson, MT Volunteer Fire Department.[217] It also notes that a BNSF hazmat team responded, and an FRA conclusion: "…the emergency response was both immediate and thorough with all precautions taken to ensure the safety of the general and traveling public within the area of the incident."[218] The same report indicates that local fire and police resources were at the site by 6:03pm, or 9 minutes after the derailment occurred.[219] It is not clear when the BNSF hazmat team arrived, but they arrived capable of applying earthen dams and transloading the crude oil from the damaged cars.[220]

While the available information limits what can be said about spill response improvements, a comprehensive plan ensures that a railroad transporting large quantities of oil has available sufficient resources to respond to a worst-case discharge. For smaller-sized spills, the WCD planning volumes provide a margin of safety.

The Culbertson, MT derailment is also an example of the diverse array of organizations that can be involved at a crude oil train derailment. Comprehensive plans can enhance the ability of plan holders to effectively coordinate with Federal, State, and local partners by identifying personnel and contacts and ensuring notification procedures are delineated within the comprehensive plan.

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[214] Ibid.
[215] "Culberton, Mont., Derailment Update." KFYR-TV, July 17, 2015, available at: http://www.kfyrtv.com/home/headlines/Culbertson-Mont-Derailment-Updates-316185901.html
[216] "Montana train derailment spilled 35,000 gallons of crude oil," Reuters, July 17, 2015, available at: https://www.reuters.com/article/us-usa-derailment-montana/montana-train-derailment-spilled-35000-gallons-of-crude-oil-idUSKCN0PR24R20150717
[217] See FRA Culbertson report
[218] Ibid.
[219] Ibid.
[220] Ibid.

6. Appendix C: Executive Order 13771

On January 30, 2017, the President issued Executive Order 13771, titled "Reducing Regulation and Controlling Regulatory Costs." Since publication of the Executive Order, OMB has issued guidance to all Executive agencies as to how to account for the cost and cost savings on all regulatory, deregulatory, and other policy documents. This final rule results in costs; therefore, this rulemaking is subject to the requirements of Executive Order 13771.

The annualized costs of this rulemaking, using a 7 percent discount rate, are estimated at $3.37 million over 10 years. PHMSA projects that the costs described in years 2–6 of the current 10-year analysis would form a repeating pattern into perpetuity. That is, the costs that occur in years 2–5 recur in years 7–10 as shown in the analysis, and year 6 costs would occur in year 11 if the analysis were extended that far, and that pattern of year 6 costs recurring after 4 years of year 2–5 costs would continue to recur in future years. That same pattern of recurring costs would continue indefinitely with no obvious non-arbitrary stopping point. These recurring costs are used in developing perpetual cost estimates and perpetual annualized costs for the rulemaking as required by Executive Order 13771 accounting conventions. This analysis produces perpetual annualized cost expressed in 2016 dollars, and discounted to 2019 (the year the rule goes into effect and cost realized) using a 7 percent discount rate, of $3.23 million, with corresponding perpetual net present value costs of $46.18 million.

The next step, which is conducted solely for OMB reporting, is to convert the annualized numbers into values as of 2016. The RIA was developed using 2016 figures, so there is no need for inflation adjustment. However, Executive Order 13771 accounting conventions also call for discounting future year dollar figures back to 2016. In this case, the costs would begin to be incurred in 2019, so discounting back to 2016 values results in estimated annualized costs of $2.64 million and total costs of $37.7 million.